Volume 2, SF Bay and Central Coast Regional Reports

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Sent: Tuesday, December 10, 2013 12:46 AM
To: DWR CWP Comments
Attachments: Summary of Comments on Vol~1.pdf (1 MB) ; Summary of Comments on Vol~2.pdf (1 MB)

The Santa Clara Valley Water District's comments on the San Francisco Bay and Central Coast Regional Reports are attached.

Santa Clara Valley Water District

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Central Coast Hydrologic Region

[This section is underdevelopment.]

Current State of the Region

Setting

The Central Coast Hydrologic Region extends from southern San Mateo County in the north to Santa Barbara County in the south (Figure CC-1 Central Coast Hydrologic Region). The region includes all of Santa Cruz, Monterey, San Luis Obispo, and Santa Barbara counties, most of San Benito, and parts of San Mateo, Santa Clara, Ventura, and Kern counties. Geographically, the vegetation and topography of the Central Coast is highly variable and includes redwood forests, foggy coastal terraces, chaparral-covered hills, green cultivated valley floors, stands of oak, warm and cool vineyards, and semi-arid grasslands. The climate and microclimates of the region are unique and foster both ecological and agricultural diversity.

PLACEHOLDER Figure CC-1 Central Coast Hydrologic Region

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the report.]

Among all of California's hydrologic regions, the Central Coast is the most reliant on groundwater for its water supply (Figure CC-2).

PLACEHOLDER Figure CC-2 Agricultural and Urban Demand Supplied by Groundwater – DWR Bulletin 118

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the report.]

Groundwater supplies are locally supplemented by stream diversions, timed releases from regional reservoirs, and some imported surface water. Factors that affect water availability in the region include precipitation, groundwater recharge capacity, groundwater quality degradation, groundwater pumping management styles or practices, surface water and reservoir storage capacity, as well as the annually variable SWP and CVP water deliveries.

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The Central Coast Hydrologic Region receives very little snow, and floodwaters originate primarily from rainstorms in winter and spring. Streams draining the mountains of the Central Coast are subject to short, intense floods, causing frequent flood damage in agricultural and urban areas. Most streams produce

Summary of Comments on Vol2_CentralCoast_RR_PRD_Sept25_FG_Final_JW_wo.pdf

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1 Number: 1 Author: georcook Subject: Highlight Date: 12/2/2013 10:46:01 AM
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slow-rise floods, but the steep mountainous terrain can produce flash floods that are intense and of short duration. Extended precipitation may produce debris flows, particularly after a season of hillside fire damage, and the steepness of the streams can increase the sediment size to boulder proportions. In urban areas, excessive stormwater runoff can result in shallow flooding, especially in coastal communities where storm surges may coincide with high tides. Tsunamis, though rare, also pose a threat to the low-lying coastal areas. Structural failure of the region's dams, levees, and other water-related infrastructure also provides the potential for flooding.

Flooding is a significant issue in the Central Coast Hydrologic Region, and exposure to a 500-year flood event threatens one in three residents, more than $40 billion dollars of assets (crops, buildings, and public infrastructure), and over 310 sensitive species. In Monterey County, more than 50 percent of the population is exposed to 500-year flood event. In the Central Coast region, local flood-related projects totaling $280 million have been proposed, including major projects on the Carmel River, Pajaro River, Salinas River, Soap Lake, and Llagas Creek.

Flood damage has been observed in the Central Coast Hydrologic Region since at least 1861. For a list of floods in this hydrologic region, refer to the California Flood Future Report Attachment C: Flood History of California Technical Memorandum.

Watersheds

The Central Coast Hydrologic Region is divided here into the Northern and Southern Planning Areas. These Planning Areas are geographic collections of individual and shared watersheds with the Monterey-San Luis Obispo county line serving as the boundary between the two Planning Areas. All rivers within the Central Coast region drain into the Pacific Ocean. Following are summary descriptions of each Planning Area. See Figure CC-3.

PLACEHOLDER Figure CC-3 Central Coast Hydrologic Region Watersheds

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the report.]

Northern Planning Area Watersheds

The Northern Planning Area contains all of Santa Cruz and Monterey counties, most of San Benito County, the southern part of Santa Clara County, and a small part of southern San Mateo County. The main rivers in the region are the San Lorenzo, Pajaro, Salinas, San Benito, Carmel, San Antonio, and Nacimiento. Coastal watersheds west of the northern Santa Lucia Range include the Little Sur and Big Sur rivers and numerous coastal streams, some of which are perennial.

The San Lorenzo River originates at the crests of the Santa Cruz and Ben Lomond Mountain ranges and enters the Pacific Ocean at Santa Cruz. The upper areas are heavily forested, and criss-crossed with many old logging roads that now serve rural residences. The Pajaro River begins in southern Santa Clara County and is joined by Pacheco Creek, the San Benito River, and Tres Piños Creek. The Pajaro River watershed spans four counties, covering over 1,300 square miles. The river enters Monterey Bay and the Pacific Ocean west of Watsonville. The Pajaro River watershed is one of the Central Coast regions largest and is well known for its productive agricultural soils and powerful flooding characteristics.

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2 Number: 1 Author: georcook Subject: Highlight Date: 12/3/2013 3:39:41 PM
SCVWD recommends also providing information on 100 year floods, as this is what most flood control projects have as a design requirement.

3 Number: 2 Author: georcook Subject: Highlight Date: 12/2/2013 10:52:40 AM
Santa Cruz Mountain Range

The Gilroy-Hollister Groundwater Basin covers approximately 29 square miles. The primary groundwater-bearing formation consists of fairly well consolidated clay, silt, and sand with gravel lenses (DWR, 2004). The formation underlies most of the basin and well yields in the aquifers average around 400gpm.

The Santa Maria River Valley Groundwater Basin encompasses approximately 290 square miles. Primary groundwater-bearing formations include unconsolidated alluvium and dune sands consisting of layers of gravel, sand, silt, and clay and range up to 250 feet thick (DWR, 2004). Well yields have been reported up to 2,500 gpm.

The Santa Barbara Groundwater Basin encompasses approximately 10 square miles. Primary groundwater-bearing formations include alluvium consisting of unconsolidated deposits of gravel, sand, silt, and clay with cobbles and boulders with a maximum alluvium thickness up to 500 feet. The alluvium is overlain by unconsolidated marine deposits. The sand, silt, and clay deposits range up to 500 feet thick beneath the City of Santa Barbara and up to 2,000 feet near the Lavigia Fault (DWR, 2004). Well yields have been reported up to 625 gpm.

Fractured-Rock Aquifers

Fractured-rock aquifers are generally found in the mountain and foothill areas adjacent to alluvial groundwater basins. Due to the highly variable nature of the void spaces within fractured-rock aquifers, wells drawing from fractured-rock aquifers tend to have less capacity and less reliability than wells drawing from alluvial aquifers. On average, wells drawing from fractured-rock aquifers yield 10 gpm or less. Although fractured-rock aquifers are less productive compared to alluvial aquifers, they commonly serve as the sole source of water and a critically important water supply for many communities. The majority of the water used in the Central Coast Hydrologic Region is derived from alluvial aquifers; therefore, information related to fractured-rock aquifers in the region was not developed as part of the Update 2013.

More detailed information regarding the aquifers in the Central Coast Hydrologic Region is available online from California Water Plan Update 2013 Vol. 4 Reference Guide – California's Groundwater Update 2013 and DWR Bulletin 118-2003.

Well Infrastructure and Distribution

Well logs submitted to DWR for water supply wells completed during 1977 through 2010 were used to evaluate the distribution of water wells and the uses of groundwater in the Central Coast Hydrologic Region. DWR does not have well logs for all the wells drilled in the region; and for some well logs, information regarding well location or use is inaccurate, incomplete, ambiguous, or missing. Hence, some well logs could not be used in the current assessment. However, for a regional scale evaluation of well installation and distribution, the quality of the data is considered adequate and informative. The number and distribution of wells in the region are grouped according to their location by county and according to six most common well-use types: domestic, irrigation, public supply, industrial, monitoring, and other. Public supply wells include all wells identified in the well completion report as municipal or public. Wells identified as "other" include a combination of the less common well types, such as stock wells, test wells, or unidentified wells (no information listed on the well log).

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4 Number: 1 Author: georcook Subject: Highlight Date: 12/4/2013 1:57:17 PM

According to B118-03, the four subbasins in the Gilroy-Hollister Groundwater Basin cover 173,600 acres, which approximately 270 sq miles
The online version of B118-03 numbers add up to 287 square miles

5 Number: 2 Author: trachemm Subject: Comment on Text Date: 12/3/2013 3:41:24 PM

This information seems more appropriate for the Regional Conditions section of the report.

Five counties were included in the analysis of well infrastructure for the Central Coast Hydrologic Region. Santa Cruz, Monterey, San Luis Obispo, and Santa Barbara Counties are fully contained within the region and most of San Benito County is also contained within the region, while San Mateo, Santa Clara, and Ventura Counties are only partially contained within the region. Well log data for counties that fall within multiple hydrologic regions were assigned to the hydrologic region containing the majority of alluvial groundwater basins within the county. Well log data for San Mateo and Santa Clara counties are discussed in the Regional Report for the San Francisco Bay Hydrologic Region and well log data for Ventura County are discussed in the Regional Report for the South Coast Hydrologic Region. Well log information listed in Table CC-2 and illustrated in Figure CC-5 show that the distribution and number of wells vary widely by county and by use. The total number of wells installed in the region between 1977 and 2010 is approximately 31,000. In most counties, domestic use wells make up the majority of well logs — about 8,400 is in San Luis Obispo County, followed by about 3,800 in Monterey County, and 2,500 in Santa Cruz County. The small number of well logs in San Benito County (about 1,700) is the result of community water providers in the northern portion of the county for the cities of Gilroy and Hollister, where most of the county's population is located, along with the remote access and sparse population within the other groundwater basins and sub-basins in San Benito County.

PLACEHOLDER Table CC-2 Number of Well Logs by County and Use for the Central Coast Hydrologic Region (1977-2010)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the report.]

PLACEHOLDER Figure CC-5 Number of Well Logs by County and Use for the Central Coast Hydrologic Region (1977-2010)

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Figure CC-6 shows that domestic wells make up the majority of well logs (56 percent) for the region while irrigation wells account for about 12 percent of well logs; monitoring wells account for about 16 percent of well logs. Communities with a relatively high percentage of monitoring wells may indicate the presence of groundwater quality monitoring to help characterize groundwater quality issues. Since the region is heavily reliant on groundwater for domestic consumption, groundwater monitoring, as expected, is extensive.

PLACEHOLDER Figure CC-6 Percentage of Well Logs by Use for the Central Coast Hydrologic Region (1977-2010)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the report.]

Figure CC-7 shows a cyclic pattern of well installation for the region, with new well construction ranging from about 375 to 1600 wells per year. Multiple factors are known to affect the annual number and type of wells drilled. Some of these factors include annual variations in climate, economy, agricultural cropping trends, or alternative water supply availability.

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6 Number: 1 Author: BehzAhma Subject: Highlight Date: 12/4/2013 1:58:17 PM
City of Gilroy is in Santa Clara County and not San Benito

PLACEHOLDER Box CC-1 California Statewide Groundwater Elevation Monitoring (CASGEM) Basin Prioritization Data Considerations

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the report.]

Figure CC-8 shows the groundwater basin prioritization for the region. Of the 60 basins within the region, eight basins and subbasins were identified as high priority, 17 as medium priority, one as low priority, and the remaining 34 basins as very low priority. Table CC-3 lists the high, medium, and low CASGEM priority groundwater basins for the region. The eight high priority basins account for about 48 percent of the population and about 45 percent of groundwater supply for the region. The basin prioritization could be a valuable tool to help evaluate, focus, and align limited resources for effective groundwater management, and reliability and sustainability of groundwater resources.

PLACEHOLDER Figure CC-8 CASGEM Groundwater Basin Prioritization for the Central Coast Hydrologic Region

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the report.]

PLACEHOLDER Table CC-3 CASGEM Groundwater Basin Prioritization for the Central Coast Hydrologic Region

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Central Coast Hydrologic Region Groundwater Monitoring Efforts

Groundwater resource monitoring and evaluation is a key aspect to understanding groundwater conditions, identifying effective resource management strategies, and implementing sustainable resource management practices. California Water Code (§10753.7) requires local agencies seeking State funds administered by DWR to prepare and implement groundwater management plans that include monitoring of groundwater levels, groundwater quality degradation, inelastic land subsidence, and changes in surface water flow and quality that directly affect groundwater levels or quality. This section summarizes some of the groundwater level, groundwater quality, and land subsidence monitoring efforts within the Central Coast Hydrologic Region. Groundwater level monitoring well information includes only active monitoring wells — those wells that have been measured since January 1, 2010. *Additional information regarding the methods, assumptions, and data availability associated with the groundwater monitoring is available online from California Water Plan Update 2013 Vol. 4 Reference Guide – California's Groundwater Update 2013.*

Groundwater Level Monitoring

A list of the number of monitoring wells in the region by monitoring agencies, cooperators, and CASGEM monitoring entities is provided in Table CC-4. The locations of these monitoring wells by monitoring entity and monitoring well type are shown in Figure CC-9. Table CC-4 shows that a total of 817 wells in the region have been actively monitored for groundwater levels since 2010. The U.S. Geological Survey (USGS) monitors 414 wells in the region. Four cooperators and four CASGEM monitoring entities monitor a combined 403 wells in 13 basins and subbasins. A comparison of Figure CC-8 discussed previously and Figure CC-GW-6 indicate that groundwater basins identified as having

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7 Number: 1 Author: trachemm Subject: Comment on Text Date: 12/3/2013 3:43:09 PM
This seems like it belongs in the Regional Conditions sections.

information and includes analytical tools and reporting features to assess groundwater quality. This system currently includes groundwater data from the SWRCB, Regional Water Quality Control Boards (RWQCBs), California Department of Public Health (CDPH), Department of Pesticide Regulation (DPR), DWR, USGS, and Lawrence Livermore National Laboratory (LLNL). In addition to groundwater quality data, GeoTracker GAMA has more than 2.5-million depth to groundwater measurements from the Water Boards and DWR, and also has oil and gas hydraulically fractured well information from the California Division of Oil, Gas, and Geothermal Resources. Table CC-5 provides agency-specific groundwater quality information. Additional information regarding assessment and reporting of groundwater quality information is furnished later in this report.

PLACEHOLDER Table CC-5 Sources of Groundwater Quality Information

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Land Subsidence Monitoring

Land subsidence has been shown to occur in areas experiencing significant declines in groundwater levels. The 2006 Groundwater Management Plan (GWMP) submitted by the Monterey County Resource Management Agency recognizes the potential for land subsidence in Salinas Valley, but due to stable groundwater elevations, the Agency has opted not to monitor subsidence. The 2007 GWMP, submitted by the Soquel Creek Water District, also discusses the potential for land subsidence within the district's groundwater basin boundaries despite there being no anecdotal evidence of such nor any previous formal studies conducted (Soquel, 2007). However, to be in compliance with Senate Bill (SB) 1938, they have elected to monitor the potential for such within the district's groundwater basins.

In the southern portion of the hydrologic region, the Santa Barbara County Water Agency in cooperation with the USGS, is in the process of publishing a report (to be released in 2014) showing subsidence due to groundwater withdrawal in the Cuyama Basin. Results from this monitoring effort are provided later in this report.

In the 2011 GWMP issued by City of Paso Robles and the San Luis Obispo County Flood Control and Water Conservation District, minor land subsidence in the northeast portion of the basin has been documented by the use of Interferometric Synthetic Aperture Radar (InSAR). Since the maximum decline in surface elevation was approximately two inches with a corresponding 60-foot groundwater level decline, no further study after the 1997 report was planned. The GWMP states that no correlation exists in measured land subsidence resulting from groundwater withdrawal from the basin over long periods of time. However, some of the areas with documented subsidence by InSAR analysis do correspond with reduction in groundwater levels during 1997 (PRGAC, 2011).

Ecosystems

Within the Central Coast region, the varied and often unique flora and fauna are supported by ecosystems that reflect the local geology, hydrology, and climate. Distinct ecological sections are represented in the region: the Central California Coast, the Central California Coast Range, and the Southern California Coast, of which only Santa Barbara County is a part. Each of these ecological sections has ecosystems that support diverse, sometimes specialized, assemblages of plants and animals. The Central Coast is

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Need to recognize that some agencies like SCVWD also monitor groundwater quality conditions and prepare annual water quality reports.

willows, sycamores, manzanita, and grasslands. Semiarid mountains, serpentine habitats, grasslands, juniper and oak woodlands provide habitat and migration corridors for a wide variety of native species.

The Carrizo Plain, east of the Cuyama River and the Caliente Range, contains 250,000 acres of native California grasslands — the largest single native grassland remaining in California. The plain's ecosystem supports the largest concentration of endangered animal species in California.

Santa Barbara County is located at a point of transition between the Southern California and Northern California ecozones and is characterized by rare plant assemblages. More than 1,400 plant and animal species are found in the county. Several salt marshes occur in Santa Barbara County and provide habitat for a number of estuarine invertebrates and fish, migratory birds, and rare and endangered animal species.

Flood

Slow-rise flooding is the overwhelmingly predominant type of flood in the Central Coast Hydrologic Region. Debris flows occur in most major storms, particularly when forest fires of the previous season have damaged vegetation. Tsunamis are infrequent but have been known to cause major devastation. Flash floods and coastal flooding also cause damage at times, and stormwater and structure failures occasionally occur. Flood damage has been observed in the Central Coast Hydrologic Region since at least 1861.

The region was included in a statewide inundation identified as "The Great Flood" in 1861-1862. During the Great Flood, the narrow coastal plains in Santa Barbara County were flooded. In San Luis Obispo County, many creeks overflowed, including Villa, Cayucos, Morro, Little Morro, Chorro, Los Osos, and San Simeon creeks. Up to 4 feet of floodwater was sustained in downtown San Luis Obispo, and widespread flooding damaged 142 homes, 110 businesses, 16 bridges, 1,800 acres of agricultural land, and many schools, parks, and other public properties, as well as utility and rail lines.

In 1937, Llagas Creek overflowed and damaged the Gilroy-Morgan Hill-San Martin area. There was regional inundation in February and March of 1938, and damages totaled $1.2 million. The December 1955 flood inundated 14,400 acres in the northern portion of the Central Coastal Hydrologic Region and caused $16 million in damage. In March and April of 1958, the Pajaro River severely eroded its levees, and the Carmel River flooded adjacent lands near State Highway 1. In December 1966 through January 1967, in the Salinas Valley, the Salinas River overflowed and damaged farmlands, industry, and to a lesser extent public facilities, businesses, homes, and its own banks. One life was lost, about 32,000 acres of agricultural lands were flooded, and USACE estimated $6.1 million in damages, approximately $1.1 million of which were in Santa Barbara County.

In January and February of 1969, a series of Pacific storms brought widespread damage to central and southern California. In the Central Coast Hydrologic Region, damage was most severe in the Salinas River and Santa Ynez River basins and in the Carpinteria-Montecito area. In January, both sides of the Salinas River flooded from San Ardo to Spreckels, destroying roads and bridges, flooding sewage treatment plants, and eroding farmland. The Carmel River overflowed and washed out a local bridge. In San Luis Obispo, businesses were damaged heavily when San Luis Obispo Creek became clogged with debris and overflowed. The Santa Maria River flooded lowlands west of Santa Maria. There was heavy damage at Lompoc, Solvang, and Vandenberg Air Force Base when the Santa Ynez River overflowed. Santa Monica, Franklin, and San Ysidro Creeks overflowed, causing heavy sedimentation and flood

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Number: 1 Author: trachemm Subject: Comment on Text Date: 12/3/2013 3:48:39 PM

Upper Llagas Creek flood protection is a priority issue for SCVWD in the Pajaro River Watershed. Would like to see it mentioned a couple more times if possible. Floods in 1937, 1955, 1958, 1962, 1963, 1969, 1982, 1986, 1996, 1997, 1998, 2002, 2008, 2009 and 2011 damaged existing homes and businesses. The largest recorded flood, estimated to be a 33-year event, occurred in December 1955.

renewed unimpaired access to 25 miles of spawning and rearing habitat for the threatened South-Central California Coast steelhead.

Southern Planning Area

San Luis Obispo

The San Luis Obispo IRWM region is organized into 16 Water Planning Areas (WPAs.) For this region, the federally protected species South-Central California Coast steelhead (Oncorhynchus mykiss) was used as the primary indicator species to develop regional Environmental Water Demands, as shown in the table below (Table CC-11):

PLACEHOLDER Table CC-11 Environmental Water Demands, San Luis Obispo IRWM

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A Habitat Conservation Plan for the upper watershed of the Arroyo Grande Creek calls for modified stream releases from Lopez Reservoir into the creek, with the intention of partially restoring and enhancing the habitat of steelhead trout and red-legged frogs.

Santa Barbara Countywide

Segments of the Sisquoc River (mostly within the San Rafael Wilderness) are designated as part of the national Wild and Scenic River system, which results in unimpaired runoff along a 33-mile stretch. Populations of fish exist in the upper reaches of the River.

Cachuma Reservoir, on the Santa Ynez River, is the main water supply for southern Santa Barbara County. Operations procedures endeavor to accommodate fish within the Santa Ynez River, and include surcharge of Cachuma Reservoir for a fish "pool" with specific protocol for releases, ramping, and water temperature to support fish.

In addition, ephemeral creeks along the south coast experience periods of continuous flow to the ocean.

Water Supplies

In California, both water supply and land-use planning are local responsibilities[1] of utilities and city and county governments. Given its limited desire for and access to imported water, local groundwater and surface water provides most of the Central Coast supply. For 2010, imported water for the Northern Planning Area includes[2] 60,000 AF of Central Valley Project and[3] about 23,700 AF of State Water Project; imported water for the Southern Planning Area includes about 22,400 AF of SWP. See Figure CC-17 for an overview of the flow of water in the region.

PLACEHOLDER Figure CC-17 Central Coast Regional Inflows and Outflows in 2010

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10 Number: 1 Author: trachemm Subject: Comment on Text Date: 12/3/2013 3:53:21 PM
Need to recognize the role of water agencies for water supply planning. Not all are utilities.

11 Number: 2 Author: trachemm Subject: Comment on Text Date: 12/3/2013 3:54:17 PM
Doesn't match numbers in Figure CC-17.

12 Number: 3 Author: trachemm Subject: Comment on Text Date: 12/3/2013 3:54:54 PM
Who in the northern planning area gets SWP water?

Northern Planning Area

Santa Cruz

For the Santa Cruz area, streams and groundwater provide all of the supply for agricultural users, residential, municipal, and industrial. In 2010, the Santa Cruz Region used approximately 35,000 AF. Seventy-eight percent of this supply was groundwater, 21% came from surface water and less than 2% came from recycled wastewater.

The City of Santa Cruz Water Department obtains surface water from the San Lorenzo watershed, with diversions from the San Lorenzo River, Liddell Spring, several creeks, Loch Lomond reservoir, and groundwater from the Live Oak Wells. The San Lorenzo Valley Water District utilizes surface water diversions first and then groundwater obtained from the Santa Margarita and Lompico Sandstone aquifers. Soquel Creek Water District and Central Water District rely entirely on groundwater from the Purisima Formation and Aromas Formation aquifers. Lompico County Water District supply is obtained from the Santa Margarita and Monterey aquifers as well as Lompico Creek. The supplies for Davenport County Sanitation District are surface water diversions from Mill Creek and San Vicente Creek. Otherwise, small drinking water systems rely mostly upon groundwater.

There are two major groundwater basins recognized in the Santa Cruz IRWM region - the Santa Margarita and Soquel-Aptos. The Santa Margarita Basin, in the San Lorenzo River watershed, is a sequence of Tertiary-age sandstone, siltstone, and shale. A 2006 groundwater model calculates a sustainable yield of about 3,320 AFY for the basin. Although current pumping rates are less than the modeled sustainable yield, groundwater levels still appear to be declining in the Scotts Valley area sub-basins. The Soquel -Aptos Basin consists of the Purisima Formation, a Tertiary sandstone, and the Aromas Formation, a younger unconsolidated sandstone. The Purisima extends at depth beneath the Pajaro Valley, and the overlying Aromas serves as the main water-bearing aquifer in the Pajaro Valley. Sustainable yield of the Purisima is estimated to be less than 5,700 AFY, while groundwater production over the past 5-years is estimated by the Santa Cruz County Water Resources to have averaged about 5,900 AFY.

Because the Purisima and Aromas Formations extend offshore beneath Monterey Bay, the aquifers are in hydrologic connection with the Pacific Ocean. Consequently, overdraft of the basin has the potential to pull seawater into the aquifer beneath the inland areas. Groundwater levels are currently below the elevations determined to be necessary to prevent seawater intrusion. The Soquel Creek Water District has determined that it needs to reduce pumping by 1500 AFY for 20 years in order for groundwater levels to recover to safe levels in the Soquel-Aptos basin.

Ben Lomond Mountain provides a limited source of groundwater, and the Summit Area has limited groundwater as well, with many homes relying on trucked water for supply during dry parts of the year.

Water supply reliability for both agriculture and municipal use is a concern in the Watsonville area. Due to seawater intrusion, some coastal wells have become too brackish for domestic or agricultural use. Groundwater is the primary source of agricultural water supply, supplemented by recycled water and surface water that has been captured and recharged to the groundwater basin.

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13 Number: 1 Author: trachemm Subject: Comment on Text Date: 12/3/2013 3:57:41 PM

This paragraph needs to be in the Pajaro River Watershed section and not the Santa Cruz section. Water supply issues are covered by the Pajaro IRWM region.

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groundwater overdraft and

Pajaro River Watershed

The Pajaro River watershed is reliant on groundwater supplies which have been affected by both seawater intrusion and overdraft. The quality and quantity of groundwater supplies varies throughout the region. In the region about 90% of water demand comes from agriculture, which also affects groundwater quality due to irrigation run-off and percolation.

Portions of San Benito and Santa Clara Counties rely on imported water from the Central Valley Project ~~and State Water Project~~ from the San Luis Reservoir, as well as, groundwater, recycled water, and local surface water. Both Santa Clara Valley Water District and San Benito County Water District have conjunctive use programs. Uvas and Hernandez reservoirs are important for conjunctive use operations in Santa Clara and San Benito counties, respectively.

Greater Monterey

Groundwater is the main source of water for most of the Greater Monterey County IRWM planning region; however, residents along the Big Sur coast depend entirely on surface water and shallow wells for their water supply, and residents near Greenfield in the Salinas Valley have a diversion from the Arroyo Seco River. The Greater Monterey County IRWM region receives no imported water.

The largest groundwater basin in the planning region is the Salinas Valley Groundwater Basin. The basin is located entirely within Monterey County and consists of one large hydrologic unit comprised of five subareas: Upper Valley, Arroyo Seco, Forebay, Pressure, and East Side. These subareas have different hydrogeologic and recharge characteristics but do not contain barriers to horizontal flow. The Upper Valley, Arroyo Seco and Forebay subareas are unconfined and in direct hydraulic connection with the Salinas River.

Groundwater recharge in the Salinas Valley is principally from the Salinas River, Arroyo Seco, other tributaries to the Salinas River, and from deep percolation of rainfall. Both natural runoff and conservation releases from Nacimiento and San Antonio Reservoirs contribute to the flow in the Salinas River. It is estimated that stream recharge accounts for approximately half of the total basin recharge. Deep percolation of applied irrigation water is the second largest component of the groundwater budget.

Other groundwater basins in the Greater Monterey County IRWM region include a portion of the Pajaro Valley Groundwater Basin in the north and Lockwood Valley, Cholame Valley, and Peach Tree Valley basins in the south. As well, approximately one quarter of the Paso Robles Groundwater Basin lies within the Greater Monterey County IRWM region, with the remainder residing in the San Luis Obispo IRWM region.

Monterey Peninsula, Carmel Bay, South Monterey Bay

For part of coastal Monterey, nearly all of the water supply comes from the Carmel River and groundwater in the Carmel Valley aquifer, which underlies the alluvial portion of the Carmel River downstream of the San Clemente Dam, and groundwater in the coastal subareas of the Seaside Groundwater Basins. About 70 to 80 percent of the surface runoff in the Carmel River watershed is from rainfall within the Los Padres National Forest and Ventana Wilderness.

Hydrological investigations have shown that the Seaside Groundwater Basin can sustainably yield about 3,000 acre-feet of water annually, before being degraded by seawater intrusion. However, between 1995

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15 Number: 1 Author: trachemm Subject: Inserted Text Date: 12/3/2013 4:13:27 PM
, some of

16 Number: 2 Author: trachemm Subject: Comment on Text Date: 12/3/2013 4:16:41 PM
Need to include a discussion specific to the Pajaro Valley and overdraft. The paragraph at the end of the previous page (with edits) would suffice.

17 Number: 3 Author: trachemm Subject: Cross-Out Date: 12/3/2013 4:12:37 PM
We only get CVP water from San Luis Reservoir.

18 Number: 4 Author: BehzAhma Subject: Highlight Date: 12/4/2013 2:06:19 PM
Chesbro is also important part of the conjunctive use operation in Santa Clara

PLACEHOLDER Table CC-12 Santa Barbara Countywide IRWM Water Supplies

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Groundwater

The amount and timing of groundwater extraction, along with the location and type of its use, are fundamental components for building a groundwater basin budget and identifying effective options for groundwater management. Although some types of groundwater extractions are reported for some California basins, the majority of groundwater pumpers are not required to monitor, meter, or publicly record their annual groundwater extraction amounts. Groundwater supply estimates furnished herein are based on water supply and balance information derived from DWR land use surveys, and from groundwater supply information voluntarily provided to DWR by water purveyors or other State agencies.

Groundwater supply is reported by water year (October 1 through September 30) and categorized according to agriculture, urban, and managed wetland uses. The associated information is presented by planning area (PA), county, and by the type of use. Reference to total water supply represents the sum of surface water and groundwater supplies in the region, and does not take into account local reuse.

2005-2010 Average Annual Groundwater Supply and Trend

Water uses in the region are met through a combination of local river supplies, reservoir storage, imported surface water, local groundwater extraction, and recycled water supply. Table CC-13 provides the 2005-2010 average annual groundwater supply by PA and by type of use, while Figure CC-18 depicts the PA locations and the associated 2005-2010 groundwater supply in the region. The estimated average annual 2005-2010 total water supply for the region is 1,294 TAF. Out of the 1,294 TAF total supply, groundwater supply is 1,117 TAF and represents about 86 percent of the region's total water supply. Although groundwater extraction in the region accounts for only about 7 percent of California's 2005 - 2010 average annual groundwater supply; it meets 91 percent (906 TAF) of the agricultural water use and 72 percent (211 TAF) of the urban water use in the region. No groundwater resources are used for meeting managed wetland uses in the region.

PLACEHOLDER Table CC-13 Central Coast Hydrologic Region Average Annual Groundwater Supply by Planning Area and by Type of Use (2005-2010)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the report.]

PLACEHOLDER Figure CC-18 Contribution of Groundwater to the Central Coast Hydrologic Region Water Supply by Planning Are (2005-2010)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the report.]

Regional totals for groundwater based on county area will vary from the PA estimates shown in Table CC-13 because county boundaries do not necessarily align with PA or hydrologic region boundaries. The Central Coast Hydrologic Region includes all of Santa Cruz, Monterey, San Luis Obispo, and Santa Barbara Counties, most of San Benito County, and small portions of San Mateo, ~~Santa Clara~~, and Ventura Counties. For the Central Coast Hydrologic Region, county groundwater supply is reported for Santa

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some of Santa Clara County,

to 95 percent of the annual groundwater extraction, while groundwater extraction meeting urban use ranged from 62 to 75 percent. Groundwater was not used for meeting any managed wetland use.

Water Uses

There are about 1.53 million people in the Central Coast region and groundwater accounts for approximately 83 percent of the water supply used for agricultural, industrial, and municipal (urban) purposes and nearly 100 percent for rural domestic purposes (DWR, 2003). In the Salinas Valley, groundwater accounts for nearly 100% of the potable supply.

Drinking Water

In the Central Coast region there are an estimated 400 community drinking water systems and over 80% are small (serving less than 3,300 people) and most serve less than 500 people. Small water systems face unique financial and operational challenges in providing safe drinking water. Given their small customer base, many small water systems cannot develop or access the technical, managerial and financial resources needed to comply with new and existing regulations. These water systems may be geographically isolated, and their staff often lacks the time or expertise to make needed infrastructure repairs, install or operate treatments, or develop comprehensive source water protection plans, financial plans or asset management plans (EPA 2012).

In contrast, less than 20% of the region's 400 community drinking water systems are medium and large water systems, and deliver drinking water to over 90% of the region's population (see Table CC-15). These larger water systems have the financial resources to hire staff to oversee daily operations, maintenance needs, and to plan for future infrastructure replacement and capital improvements. This helps to ensure that existing and future drinking water standards can be met.

PLACEHOLDER Table CC-15 Summary of Large, Medium, Small, and Very Small Community Drinking Water Systems in the Central Coast Hydrologic Region

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the report.]

Agricultural Water

All Central Coast IRWM regions utilize water for agricultural purposes, with most of the demand met by groundwater extraction and surface water diversions. Major centers of agriculture include Gilroy, Hollister, Pajaro Valley, Watsonville, Salinas Valley, Paso Robles, San Luis Obispo, Santa Maria, Lompoc, Solvang, and Santa Barbara.

San Benito County and Santa Clara County use water purchased from USBR via the San Felipe Project in addition to groundwater supplies and recycled water. The majority of San Felipe water goes toward agricultural irrigation, with the remainder for domestic, municipal, industrial purposes, and for groundwater recharge. Southern Santa Clara County uses San Felipe water for agricultural irrigation and groundwater recharge.

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21 Number: 1 Author: trachemm Subject: Inserted Text Date: 12/3/2013 4:23:31 PM
typically

22 Number: 2 Author: trachemm Subject: Inserted Text Date: 12/3/2013 4:23:52 PM
, local surface water supplies,

Urban Water

Central Coast Urban Water Use by IRWM Region

The urban water suppliers of the Central Coast are in Table CC-16, along with total estimated delivered supplies. Urban water use includes residential, schools, parks, restaurants, hotels, office buildings, firefighting, water main flushing, and losses from leaks in the water system.

Outside of urban areas served by water purveyors, residential and small community water needs are self-supplied.

PLACEHOLDER Table CC-16 Urban Water Suppliers by IRWM Region

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the report.]

Water Conservation Act of 2009 (SB x7-7) Implementation Status and Issues

Twenty-five Central Coast urban water suppliers have submitted 2010 urban water management plans to DWR. The Water Conservation Law of 2009 (SBx7-7) required urban water suppliers to calculate baseline water use and set 2015 and 2020 water use targets. Based on data from the 2010 urban water management plans, Central Coast Hydrologic Region had a population-weighted baseline average water use of 145 gallons per capita per day and an average population-weighted 2020 target of 125 gallons per capita per day. The Baseline and Target Data for individual Central Coast urban water suppliers is available on the Department of Water Resources (DWR) Urban Water Use Efficiency website.

The Water Conservation Law of 2009 (SBx7-7) required agricultural water suppliers to prepare and adopt agricultural water management plans by December 31, 2012, and update those plans by December 31, 2015, and every 5 years thereafter. One Central Coast agricultural water supplier has submitted 2012 agricultural water management plans to DWR.

Water Balance Summary

The Northern Planning Area (PA 301) is the more urbanized and agriculturally active area in the Central Coast Region. Urban applied water varies from about 140-183 TAF. Agricultural use ranges from around 500 to 700 TAF. The wild and scenic and instream applied water varies from 25 to 124 TAF per year and is reused downstream rather than being depleted as happens in most coastal regions. There is about 400-500 acre-feet of water applied to managed wetlands in this planning area each year.

Supplies rely heavily on groundwater, with local deliveries dependent upon water year type and showing a marked decrease in recent years. The area receives about 60 to 90 TAF per year in Central Valley Project water, depending on year type. Similarly, the area receives up to 30 TAF State Water Project water in years where such water is available. There are small amounts of reclaimed water available also.

In the Southern Planning Area (PA 302), urban applied water ranges from about 140-150 TAF and agricultural use from 280-500 TAF. There is less instream environmental applied water in this PA, but it has also been reused downstream since 2005. The surface water supplies (local, State Water Project, and other federal) have remained fairly constant at about 80-90 TAF per year. Recycled water accounts for 3-5 TAF, with the rest of the water uses being supplied by groundwater.

23 Number: 1 Author: trachemm Subject: Comment on Text Date: 12/3/2013 4:25:41 PM
I don't think this is accurate. Who in the northern planning area gets SWP water?

PLACEHOLDER Figure CC-21 Central Coast Region Water Balance by Water Year, 2001-2010

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the report.]

PLACEHOLDER Table CC-17 Central Coast Hydrologic Water Balance Summary, 2001-2010

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the report.]

Project Operations

One of two sources of imported water to the Central Coast, the State Water Project – Coastal Branch Aqueduct was completed in 1997, and extends from Kettleman City in Kings County to Vandenberg Air Force Base in Santa Barbara County. It consists of 143 miles of pipeline, five 7.5 megawatt capacity pumping plants, a water treatment plant, and four water storage tanks. The pipeline consists of a 101-mile long DWR Coastal pipeline from Kern County to Vandenberg Air Force Base in Santa Barbara County and 42-mile long Central Coast Water Authority (CCWA) pipeline from Vandenberg Air Force Base to Lake Cachuma.

Supplying as much as 47,816 acre-feet of water a year, Coastal Branch supplements supplies from area reservoirs and groundwater basins. San Luis Obispo County has an agreement for 4,830 acre-feet a year and Santa Barbara County for 42,986 acre-feet.

The Nacimiento and San Antonio Reservoirs are owned and operated by the Monterey County Water Resources Agency (MCWRA) and were constructed to control floodwaters and to release water into the Salinas River for percolation to underground aquifers throughout the summer. Nacimiento Reservoir has a storage capacity of 377,900 AF, and yields on average about 62 percent of the total water in the Salinas River system. San Antonio Reservoir has a storage capacity of 335,000 AF, and yields on average about 13 percent of the total water in the Salinas River system.

The Salinas Valley Water Project, implemented by MCWRA, was created in order to reduce seawater intrusion in the downstream, coastal portion of the Salinas Valley Groundwater Basin. The Salinas Valley Water Project moves timed releases from Nacimiento and San Antonio Reservoirs down the Salinas River channel, allowing diversions into the Castroville Seawater Intrusion Project (CSIP) distribution system. The water then percolates into the Salinas Valley Groundwater Basin and is blended with recycled water for irrigation use on 12,000 acres of farmland in the Castroville area. The blended water replaces groundwater pumping in downstream coastal portion of the groundwater basin, thereby helping to reduce seawater intrusion.

~~The flood management reservoirs of the Central Coast Hydrologic Region are two major multipurpose reservoirs with flood management reservations, San Antonio Reservoir on the San Antonio River, and Twitchell Reservoir on the Cuyama River, and a small flood storage amount in Nacimiento Reservoir on Nacimiento Creek.~~

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Move to the flood section

Groundwater Conditions and Issues

Groundwater Occurrence and Movement

Aquifer conditions and groundwater levels change in response to varying supply, demand, and climate conditions. During dry years or periods of increased groundwater use, seasonal groundwater levels tend to fluctuate more widely and, depending on annual recharge conditions, may result in a long-term decline in groundwater levels, both locally and regionally. Depending on the amount, timing, and duration of groundwater level decline, nearby well owners may need to deepen wells or lower pumps to regain access to groundwater.

Lowering of groundwater levels can also impact the surface water–groundwater interaction by inducing additional infiltration and recharge from surface water systems, thereby reducing the groundwater discharge to surface water base flow and wetlands areas. Extensive lowering of groundwater levels can also result in land subsidence due to the dewatering, compaction, and loss of storage within finer grained aquifer systems.

During years of normal or above normal precipitation, or during periods of low groundwater use, aquifer systems tend to recharge and respond with rising groundwater levels. As groundwater levels rise, they reconnect to surface water systems, contributing to surface water base flow or wetlands, seeps, and springs.

The movement of groundwater is from areas of higher hydraulic potential to areas of lower hydraulic potential, typically from higher elevations to lower elevations. The direction of groundwater movement can also be influenced by groundwater extractions. Where groundwater extractions are significant, groundwater may flow towards the extraction point. Rocks with low permeability can restrict groundwater flow through a basin. For example, a fault may contain low permeability materials and restrict groundwater flow.

Depth to Groundwater

The depth to groundwater has a direct bearing on the costs associated with well installation and groundwater extraction operations. Understanding the local depth to groundwater can also provide a better understanding of the local interaction between the groundwater table and the surface water systems, and the contribution of groundwater aquifers to the local ecosystem. In some parts of the region, groundwater may be found near the ground surface, whereas in other parts, groundwater is found hundreds of feet below the ground surface. Depth-to-groundwater contours for the region were not developed as part of the groundwater content enhancement for Update 2013. Depth-to-groundwater data for a few of the groundwater basins in the region are available online via DWR's Water Data Library, DWR's CASGEM system, and the USGS National Water Information System. Nearly every local water agency within the region reports or presents groundwater level data to the public on a routine or annual basis. Websites of agencies in the region provide information pertaining to groundwater elevations.

Groundwater Elevations

Groundwater elevation contours can help estimate the direction of groundwater movement and the gradient, or rate, of groundwater flow. The DWR does not currently monitor groundwater elevations in the region. Thus, groundwater elevation contours for the region could not be developed as part of the groundwater content enhancement for Update 2013. Several local agencies within the region

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DWR should include contours for where data is available as it required to be submitted trough CASGEM. If DWR is not going to rely on the data submitted through CASGEM, the reporting requirement should be removed.

independently monitor the groundwater elevations in the basins they operate and produce groundwater elevation contour maps.

Groundwater Level Trends

Plots of depth-to-water measurements in wells over time (groundwater level hydrographs) allow analysis of seasonal and long-term groundwater level variability and trend over time. Because of the highly variable nature of the physical aquifer systems within each groundwater basin, and because of the variable nature of annual groundwater availability, recharge, and surrounding land use practices, the hydrographs presented herein do not attempt to illustrate or depict average aquifer conditions over a broader region. Rather, the selected hydrographs are intended to help tell a story about how the local aquifer systems respond to changing groundwater pumping quantity and to the implementation of resource management practices. The hydrographs are designated according to the State Well Number System (SWN), which identifies each well by its location using the public lands survey system of township, range, section, and tract.

Hydrograph PV8D PV8M/ PV8S

Hydrograph PV8D PV8M/ PV8S (CC-25A) is from a well representing data from three hydrographs provided by the Pajaro Valley Water Management Agency. The well consists of a triple-completion nested monitoring well located in the Pajaro Valley Groundwater Basin. The nested well is located approximately 5,600 feet inland from the Pacific Ocean and is completed in consolidated marine and dune sediments. Monitoring well PV8D is the deepest well in the nested well cluster with a total depth of 590 feet and a screened interval from 570 to 580 feet below the top of casing. Monitoring well PV8M is the intermediate well with a total depth of 530 feet with screened intervals from 420 feet to 470 feet below top of casing. Monitoring well PV8S is the shallow well with a total depth of 210 feet and screened intervals from 130 feet to 190 feet below top of casing. According to the Pajaro Valley Water Management Agency and illustrated in the hydrograph, while there has been significant amounts of groundwater withdrawal for urban and agricultural uses during 1991 through 2012, there is very little overall change seasonally in groundwater levels due to seawater intrusion into the aquifer.

Hydrograph 12S06E18G001M

Hydrograph 12S06E18G001M (CC-25B) is from a well located in the Hollister Area subbasin and has a total depth of approximately 200 feet. The well is completed in poorly consolidated sedimentary sequences of clay, silt, sand, and gravel. The San Benito County Water District ~~maintains~~ [1] that groundwater storage in the subbasin increased by 3,000 acre-feet due to changes in water management measures leading to the storage and use of more surface water, which in response reduced the amount of groundwater pumping. The groundwater hydrograph reflects the increase in storage as the groundwater elevation in the well showed an overall increase of approximately 15 feet from 1950 through 1990.

Hydrograph FO-09D/ FO-09S

Hydrograph FO-09D/ FO-09S (CC-25C) is from a [2] dual completion monitoring well. Monitoring well FO-09 shallow is approximately 660 feet deep with a screened interval from 610 to 650 feet below top of casing. Monitoring well FO-09 deep is approximately 840 feet deep with a screened interval from 790 to 830 feet below top of casing, completed in consolidated sediments. The hydrograph illustrates that the deeper well exhibit much greater seasonal fluctuations (approximately 11 feet per year) compared to that by the shallow well (approximately 4 feet per year). While the shallow well shows a net increase of approximately six feet in groundwater level from 1994 through 2011, the deep well shows a net

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26 Number: 1 Author: trachemm Subject: Inserted Text Date: 12/3/2013 4:31:25 PM
estimates

27 Number: 2 Author: trachemm Subject: Comment on Text Date: 12/3/2013 4:32:12 PM
In what basis is this well located?

Change in Groundwater Storage

Change in groundwater storage is the difference in stored groundwater volume between two time periods. Examining the annual change in groundwater storage over a series of years helps identify the aquifer response to changes in climate, land use, or groundwater management over time. If the change in storage is negligible over a period represented by average hydrologic and land use conditions, the basin is considered to be in equilibrium under the existing water use scenario and current management practices. However, declining storage over a period characterized by average hydrologic and land use conditions does not necessarily mean that the basin is being managed unsustainably or subject to conditions of overdraft. Utilization of groundwater in storage during years of diminishing surface water supply, followed by active recharge of the aquifer when surface water or other alternative supplies become available, is a recognized and acceptable approach to conjunctive water management. *Additional information regarding the risks and benefits of conjunctive management can be found online from California Water Plan Update 2013 Vol. 3 Ch. 9 Conjunctive Management and Groundwater Storage Resource.*

Because of resource and time constraints, changes in groundwater storage estimates for basins within the region were not developed as part of the groundwater content enhancement for Update 2013. Some local groundwater agencies within the region periodically develop change in groundwater storage estimates for basins within their service area. Determining the change in storage allows the local groundwater managers to evaluate trends, land use patterns, responses to climate, and water sustainability. Examples of local agencies who have determined change in storage include the San Benito County Water District, Monterey Peninsula Water Management District, and Pajaro Valley Water Management Agency.

Near Coastal Issues

Seawater Intrusion

Many coastal groundwater basins of the Central Coast have been, and continue to be, threatened by seawater intrusion. Seawater intrusion in the northern Salinas Valley was first documented in 1933 by the California State Water Commission. Seawater intrusion in the Pajaro groundwater basin was first identified in the 1940s and current pumping now exceeds estimates of sustainable yield by more than 20,000 acre-feet per year. Seasonal groundwater withdrawals for agriculture in Santa Cruz and Monterey counties were recognized then and now as a contributing factor to seawater intrusion.

The City of Santa Cruz Water Department (SCWD) and Soquel Creek Water District (SqCWD) have been collaborating to conserve, protect and create reliable water resources. Both have already implemented numerous stringent conservation and curtailment requirements to maximize efficient water use, but the region needs a reliable supplemental water source that will provide needed supply during droughts and protect groundwater aquifers from seawater intrusion. After over 20 years of multiple studies and scores of public meetings, SCWD and SqCWD have identified desalination as the best option for delivering this supplemental water source. This program is currently in an Environmental Review process evaluating the potential for a 2.5 million gallon per day desalination facility in Santa Cruz. No decision has yet been made on the actual construction of the proposed project.

Further south, continued groundwater pumping in overdraft conditions is contributing to seawater intrusion along several coastal basins in San Luis Obispo County. Seawater intrusion is problematic in the community of Los Osos, where the impact of intrusion has been estimated to be migrating 100 feet per year. Recent studies show strong potential for seawater intrusion into the Nipomo area.

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28 Number: 1 Author: georcook Subject: Highlight Date: 12/2/2013 12:42:27 PM
The Santa Clara Valley Water District also tracks changes in groundwater storage for the Llagas Subbasin

29 Number: 2 Author: BehzAhma Subject: Inserted Text Date: 12/4/2013 2:13:01 PM
Santa Clara Valley Water District,

PLACEHOLDER Table CC-22 Groundwater Ordinances that Apply to Counties in the Central Coast Hydrologic Region

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the report.]

Special Act Districts

Greater authority to manage groundwater has been granted to a few local agencies or districts created through a special act of the Legislature. The specific authority of each agency varies, but the agencies can be grouped into two general categories: (1) agencies having authority to limit export and extraction (upon evidence of overdraft or threat of overdraft) or (2) agencies lacking authority to limit extraction, but having authority to require reporting of extraction and to levy replenishment fees.

Court Adjudication of Groundwater Rights

Another form of groundwater management in California is through the courts. There are currently 24 groundwater adjudications in California. The Central Coast Hydrologic Region contains four of those adjudications (Table CC-23 and Figure CC-29), two of which, the Santa Maria Valley basin and Los Osos were ranked as high priority basins in the CASGEM basin prioritization project, while the other two, Seaside and Goleta were ranked as medium priority basins.

PLACEHOLDER Table CC-23 Groundwater Adjudications in the Central Coast Hydrologic Region

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the report.]

PLACEHOLDER Figure CC-29 Groundwater Adjudications in the Central Coast Hydrologic Region

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the report.]

Other Groundwater Management Planning Efforts

Groundwater management also occurs through other avenues such as IRWMPs, Urban Water Management plans, and Agriculture Water Management plans. Box CC-3 summarizes these other planning efforts.

PLACEHOLDER Box CC-3 Other Groundwater Management Planning Efforts in the Central Coast Hydrologic Region

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the report.]

Funding

Central Coast IRWM regions have been awarded over $83.3 million for planning and implementation projects, as shown in Table 24.

PLACEHOLDER Table CC-24 IRWM Grant Funding to the Central Coast (2005 to 2012)

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30 Number: 1 Author: trachemm Subject: Comment on Text Date: 12/3/2013 4:34:59 PM
Examples should be provided. SCVWD is a special act District.

Current Relationships with Other Regions and States

Regional Relationships

[This section is underdevelopment.]

Regional Water Planning and Management

Integrated Regional Water Management Coordination and Planning

[This section is under development.]

The Central Coast region is actively engaged in integrated regional water management (IRWM) planning and implementation of water projects. Each of the six Central Coast IRWM regions have demonstrated a commitment to inter-regional communication and coordination by planning and participating regularly in Central Coast conference calls. The goal of IRWM is to meet regional water management challenges by developing integrated solutions and diversified water management portfolios through the collaboration of the region's stakeholders and by planning at the regional scale. The IRWM efforts serve a vital role, in combination with local and statewide planning, to provide for sustainable water use, water quality, and environmental functions. Find information about the program at www.water.ca.gov/irwm/

Implementation Activities (2009-2013)

Implementation Projects

[This section is under development.]

Santa Cruz

- **Conjunctive Use and Enhanced Aquifer Recharge for the Lower San Lorenzo River** – Work for this project has led to the development of a potential water exchange project between four water districts in the IRWM area.
- **Integrated Watershed Restoration Program** – The program consists of watershed enhancement projects, erosion control projects, habitat restoration projects, watershed education programs, and a permit coordination program to promote voluntary participation in long-term watershed restoration.
- **Desalination Analysis** – The City of Santa Cruz partnered with the Soquel Creek Water District to complete a rigorous and successful analysis of a potential desalination plant.
- **Davenport Water Treatment Plant Improvements** - The Davenport County Sanitation District completed construction of a new membrane filtration system and water tank for the Davenport drinking water system, which no longer met State or federal drinking water standards.

Pajaro River Watershed

- **San Jerardo Water System Improvements** – San Jerardo, a disadvantaged community, has been on a bottled water order since 2001 due to nitrate and trichloropropane (TCP) contamination of its well. Construction was completed on a new well, transmission pipelines, water storage tank, and a booster pump station.

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Some example projects from the Pajaro River Watershed include the Hollister Urban Area Water and Wastewater Management Plan, the PVWMA Basin Management Plan, bench excavation in the Lower Pajaro River, recycled water pipeline in Gilroy (part of the South County Recycled Water Program.

32 Number: 2 Author: trachemm Subject: Comment on Text Date: 12/3/2013 4:35:53 PM

This is a Greater Monterey Region project.

practices such as irrigation system conversions and tailwater treatment, and will serve as a model for agricultural BMP implementation.

Clean Water Act Section 319(h) Nonpoint Source Pollution Control Program grant funds were awarded to the Coastal San Luis Resource Conservation District to implement agricultural water quality improvement projects on rangeland and farms to reduce sediment, nutrient, and pesticide pollutant loading to Morro Bay.

Agricultural Sustainability CCVT SIP Certification

In 1996, a group of Central Coast wine-grape growers pioneered an innovative whole-farm assessment system to assess vineyard sustainability. In 2008, the Central Coast Vineyard Team (CCVT) program launched a sustainability certification program, wherein third-party auditors assess the sustainability of the entire wine-growing operation. Those that meet the Sustainability in Practice (SIP) certification requirements are eligible to use the SIP seal on their wine. Currently, there are 27,000 acres certified and 300,000 cases of wine bearing the SIP seal. Additional information can be found at: http://www.vineyardteam.org/sip

Low-Impact Development

Under the guidance of the Low Impact Development Center, the following LID projects are underway:

1. A redesign of the parking lot at the Atascadero Zoo to incorporate pervious pavement, rain gardens and native vegetation to mimic the processes and functions of natural systems, allowing storm water to slow, spread and sink in. Such design features increase recharge of aquifers and filter pollutants. Additional features, such as trees and other vegetation, will provide aesthetic, cooling, and storm water management functions.
2. The Paso Robles 21st Street Complete Green Street, is a project to redesign a street near the Paso Robles Event Center that was built in a natural drainage-way and currently floods during large storms. The planned and funded project will reduce the volume and intensity of storm water runoff, increase groundwater recharge, improve pedestrian and bicyclist mobility, shade the street and promote redevelopment.

Removing Water Quality Impairments through Implementing TMDLs

The Central Coast region has many water bodies that are listed on the Clean Water Act Section 303(d) list of impaired water bodies. Total Maximum Daily Load (TMDL) development and implementation is a high priority. In 2010, the CCRWQCB was able to remove Chorro Creek (a tributary to Morro Bay), from the 303(d) list as a result of improvement in dissolved oxygen levels. The delisting was a result of actions by a discharger, several landowners, and the Morro Bay National Estuary Program. Actions included upgrade of a waste water treatment plant, restoration of a segment of Chorro Creek, and several stream fencing projects in tributaries. Dissolved oxygen is now meeting water quality standards, and nutrient and pathogen levels are declining.

Groundwater Cleanup

During the period from 2009 through 2011, 184 groundwater cleanups were completed, including 145 leaking underground fuel storage tanks and 39 other groundwater cleanup cases, such as dry cleaners and munitions production facilities. Groundwater cleanup is necessary to protect drinking water supplies throughout this groundwater-dependent region. For example, a cleanup remedy is currently underway in the Llagas groundwater basin in southern Santa Clara County, where potassium perchlorate from a

33

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TMDLs

facility that manufactured signal flares created a contaminant plume that reached 10 miles in length and polluted 188 domestic wells. The Water Board ordered cleanup in 2007, and by 2010, over 255 million gallons of groundwater had been treated and 176 of the polluted domestic wells were meeting the drinking water standard for percholorate (94%). Additional information can be found at: http://www.waterboards.ca.gov/rwqcb3/board_info/agendas/2011/July/Item9/9_stfrpt.pdf

Challenges

Region Challenges

Disadvantaged Community Water Systems

Disadvantaged communities in the region often cannot provide the economies of scale necessary to construct, operate and maintain new water facilities to meet drinking water standards. Recent grant funding has assisted some systems to begin design and construction of these needed projects, however not all projects were funded. Additional grant funding is needed to assist these and future projects.

Proposition 218

Water and wastewater systems in the region continue to plan, design and complete upgrades to their water and wastewater systems in order to meet stricter drinking water and wastewater regulations. These upgrades typically require rate increases from rate payers who may challenge these rate increases through the Proposition 218 process, which requires that any local tax imposed to pay for specific governmental programs be approved by two-thirds of the voters. The required system upgrades may be jeopardized if the rate increases are overturned, which may result in continued violations of drinking water or wastewater effluent standards or continued deterioration of water system facilities that have outlived their useful life.

Disposal of Drinking Water Treatment Waste Products

Disposal of drinking water treatment waste products can significantly increase treatment costs that are ultimately passed on to rate payers. When selecting drinking water treatment alternatives, especially for arsenic, water systems must consider the cost to dispose of drinking water treatment waste products such as backwash water or spent filter media. Spent filter media must be evaluated under the California Waste Extraction Test (WET), which is more stringent than the federal leaching tests, for classification prior to determining appropriate disposal options. As well, some spent filter media may qualify as a hazardous or radioactive waste due to the concentration and leaching characteristics of the contaminant.

Protecting Groundwater Basins

A major challenge in the Central Coast is protecting groundwater basins. The decades-long accumulation of nitrates in the groundwater basins of the Salinas, Pajaro and Santa Maria watersheds, as the result of the intensive, year-round agriculture that produces the majority of the nation's lettuce, celery, cabbage and strawberries, and the associated groundwater pumping demands, threatens the sustainability of the region's main source of water. Central Coast groundwater basins supply not only irrigation water, but also drinking water to the majority of the region's growing population.

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34 Number: 1 Author: trachemm Subject: Comment on Text Date: 12/3/2013 4:40:15 PM
Seems like there should be discussion about flooding and overdraft.

Area Challenges

Santa Cruz

- **IRWM Funding and Resource Limitations** – The Central Coast has little funding relative to the rest of the state; inter-regional IRWM planning is difficult because the Central Coast IRWM regions must compete against each other for limited grant funds.
- **Water Reliability in Santa Cruz County** - An evaluation of water supplies and demands for the City of Santa Cruz and the Soquel Creek Water District indicates that a new water supply source will be necessary to meet community demands, reduce groundwater pumping and maintain in-stream flows for fish. In 2010, both water systems completed a joint desalination pilot study to evaluate alternative treatment systems for a seawater reverse osmosis desalination plant.

Pajaro River Watershed

- The Pajaro River watershed region wants to improve water quality in Northern San Benito County.

Monterey Peninsula

- **Water Reliability in Monterey Peninsula** - The Monterey Peninsula must develop new water supplies due to a water rights cease and desist order requiring Cal-Am Water Company (the major local water supplier) to reduce water diversion from the Carmel River and an adjudication of the Seaside groundwater basin requiring Cal-Am to reduce its groundwater pumping. The Monterey Peninsula Water Management District (MPWMD) estimates that 6,000 to 8,000 acre-feet per year on average are needed to replace the required reduction in water diversions from the Carmel River and Seaside Groundwater Basin.

San Luis Obispo

- **Paso Robles Groundwater Basin Overdraft** - Groundwater levels in some parts of the basin have dropped 70 feet or more within the last 16 years. In mid-2013, San Luis Obispo County Board of Supervisors approved an emergency ordinance that requires all new water use (development or agricultural) in the basin be offset in a 1-to-1 ratio, and all new irrigation wells must be metered.

Santa Barbara

- **IRWM Funding** – Six Central Coast IRWM regions must compete for a limited amount of funding; it is difficult to connect potential project partners for interregional planning.
- **City of Santa Barbara's Cater Water Treatment Plant** - Upgrades are needed to meet more stringent disinfection byproduct regulations, so the City is constructing an ozone treatment facility to replace chlorine as a pre-oxidant for surface water supplies.
- **Groundwater** – The City began construction of a centralized groundwater treatment facility to improve groundwater quality.

Flood Challenges

Flood management in the Central Coast Hydrologic Region of California has a unique set of challenges that were identified during meetings with local agencies in the hydrologic region. These challenges include:

- Impacts of sea level rise
- Operations and maintenance costs
- Environmental regulations that restrict the ability of agencies to utilize options for flood management
- Inconsistent and unreliable funding

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35 Number: 1 Author: trachemm Subject: Comment on Text Date: 12/3/2013 4:42:38 PM
This should be move to the region challenges section.

36 Number: 2 Author: trachemm Subject: Comment on Text Date: 12/3/2013 4:42:03 PM
Other challenges include expanding recycled water use for water supply reliability, the reliability of imported water supplies, salts, and overdraft.

37 Number: 3 Author: trachemm Subject: Comment on Text Date: 12/3/2013 4:43:00 PM
This should be in the Region Challenges section.

38 Number: 4 Author: trachemm Subject: Comment on Text Date: 12/3/2013 4:43:19 PM
Move to Region Challenges

Figure CC-30 shows the change in water demands for the urban and agricultural sectors under nine growth scenarios, with variation shown across 13 climate scenarios. The nine growth scenarios include three alternative population growth projections and three alternative urban land development densities, as shown in Table CC-25. The change in water demand is the difference between the historical average for 1998 to 2005 and future average for 2043 to 2050. Urban demand is the sum of indoor and outdoor water demand where indoor demand is assumed not to be affected by climate. Outdoor demand, however, depends on such climate factors as the amount of precipitation falling and the average air temperature. The solid blue dot in Figure CC-30 represents the change in water demand under a repeat of historical climate, while the open circles represent change in water demand under 12 scenarios of future climate change.

PLACEHOLDER Figure CC-30 Change in Central Coast Agricultural and Urban Water Demands for 117 Scenarios from 2006-2005 (thousand acre-feet per year)

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the report.]

Urban demand increased under all 9 growth scenarios tracking with population growth. On average, it increased by about 40 thousand acre-feet under the three low population scenarios, 130 thousand acre-feet under the three current trend population scenarios and about 230 thousand acre-feet under the three high population scenarios when compared to historical average of about 270 thousand-acre-feet. The results show change in future urban water demands are less sensitive to housing density assumptions or climate change than to assumptions about future population growth.

Agricultural water demand decreases under all future scenarios due to reduction in irrigated lands as a result of urbanization and background water conservation when compared with historical average water demand of about 1030 thousand acre-feet. Under the three low population scenarios, the average reduction in water demand was about 100 thousand acre-feet while it was about 210 thousand acre-feet for the three high population scenarios. The results show that low density housing would result in more reduction in agricultural demand since more lands are lost under low-density housing than high density housing.

Future Water Quality

Below are recommendations that, if implemented on a regional scale, will protect water quality and public health, promote sustainable water supplies, and improve our ability to measure performance in protecting and restoring groundwater resources. Most require coordination and cooperation among many entities, and may entail changes in policy as well.

Groundwater Recharge Area Protection - The Central Coast Region relies heavily on groundwater for drinking water and agricultural irrigation. Preservation of groundwater quality in source areas will be accomplished by identifying and protecting groundwater recharge locations.

- [1]Identify and map recharge areas (consistent with AB 359, Huffman 2011)
- Develop local and statewide land use management requirements (e.g., ordinances, regulations, Basin Plan amendments, etc.) to protect and restore recharge areas.
- Implement programs and projects to increase the amount of clean water recharge (e.g., Low-Impact Development).

39

Number: 1 Author: georcook Subject: Highlight Date: 12/2/2013 1:01:26 PM

The recharge area for Llagas Subbasin has been mapped. SCVWD recommends being specific as to who would implement the recommendations.

- Utilize integrated regional water management to address complex issues, such as infiltration management, basin recharge, etc.

Regional/Basin-wide Groundwater Monitoring and Assessment- Understanding of the quality and quantity of water in our groundwater basins is essential to successful management. The following strategies will provide increased data availability/transparency and use:

- Coordinate with local agencies to build on existing programs and develop programs where they are lacking.
- Improve data management - build on GeoTracker GAMA as the centralized database to consolidate groundwater quality, and CASGEM for well and hydrogeologic data.
- Develop monitoring programs for shallow groundwater.
- Implement drinking water quality monitoring requirements, with reporting into GeoTracker, for the most at-risk population of water users who rely on domestic wells and local small and State small water systems/wells for their potable supply.

Source Control of Nitrate and Salt Loading to Groundwater - The significant and ongoing loading of nitrate and salts is the largest threat to public health and groundwater quality within the region. Irrigated agriculture is the most significant source of loading.

- Implement the Central Coast's Irrigated Lands Regulatory Program to monitor and reduce pollutant loading from irrigated agriculture.
- Facilitate the development and implementation of salt and nutrient management plans (per SWRCB Recycled Water Policy, Resolution 2009-0011).
- Develop regional permitting strategy, in alignment with pending salt and nutrient management plans, to address salt and nutrient loading from municipal discharges and recycling projects (e.g., develop consistent permit requirements and support development of coastal brine disposal facilities).

Widespread Improvements in Agricultural Irrigation Efficiency and Management - The Central Coast has approximately 435,000 acres of very productive irrigated agriculture, much of it intensively cropped nearly year-round, making it the third largest land use in the region, after open space and rangeland. Irrigated agriculture is the largest user/pumper of groundwater within the agricultural areas of the region, and contributes the largest fraction of return flows to both surface water and groundwater. Improved irrigation management can reduce off-site movement of water that carries pollutants to surface and groundwater, reduce erosion and sedimentation, and reduce overdraft of groundwater basins.

- Improve water use measurement
- Improve irrigation scheduling, such as through expanded use of climate information (CIMIS)
- Increase knowledge of crop water needs

Riparian Buffer Zone Designation and Protection - Riparian lands adjacent to streams, lakes, or other surface water bodies that are adequately vegetated provide an important environmental protection and water resource management benefit.

- Implement specifications for the establishment, protection, and maintenance of riparian vegetation
- Adopt a Basin Plan amendment for riparian protection
- ~~Adopt~~ local ordinances protecting riparian areas
- Improve statewide riparian and wetland protection policies

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40 Number: 1 Author: georcook Subject: Highlight Date: 12/2/2013 1:04:54 PM
Monitoring programs are best developed and managed by the local/regional agencies who are most familiar with the local/regional hydrogeology. SCVWD recommends providing funding to assist in development and implementation of shallow groundwater monitoring programs, with the priority on those areas that are currently unmonitored.

41 Number: 2 Author: georcook Subject: Highlight Date: 12/5/2013 9:53:12 AM
A monitoring and requirement for individual domestic wells and small systems may pose a significant economic burden. This requirement may be unnecessary in areas where local agency monitoring programs are adequately characterizing the aquifer conditions. SCVWD recommends careful study of the potential economic burden to well owners, areas that may already be adequately monitored, and funding options (including state funding or assessments on polluters).

42 Number: 3 Author: trachemm Subject: Comment on Text Date: 12/4/2013 8:54:00 AM
A more appropriate recommendation would be to develop guidelines. Agencies may have their own guidelines/ordinances already. They may also be subject to regulations/permit requirements that limit maintenance activities. Also, different conditions warrant different levels of effort.

43 Number: 4 Author: trachemm Subject: Inserted Text Date: 12/4/2013 8:54:28 AM
Support adoption of

- ~~Implement r~~angeland management measures

Widespread Implementation of low-impact development (LID) – low-impact development techniques, such as increasing urban surface permeability and creating swales and vegetated areas to allow increased infiltration of rainwater, can improve water quality by reducing pollution being transported to streams and coastal areas (e.g. bacteria, pesticides, and fertilizers) and increasing ~~recharge of clean groundwater.~~

- ~~Adopt l~~ocal ordinances requiring LID
- Establish standards for hydromodification
- Expand the Central Coast LID Initiative

Widespread Implementation of Urban Water Conservation - Urban water conservation has the potential to improve water quality by reducing basin overdraft/seawater intrusion in some areas and eliminating summer flows that carry pollutants to surface waters.

- Increase use of incentives to encourage rapid adoption of water saving technologies (e.g., toilet exchange programs, credits for drought-tolerant landscaping, grey water retrofits, rainwater collection systems)

The recommendations, implementation actions and accomplishments of the Central Coast Water Board identify solutions and actively address the water quality challenges we face. Integrated regional water management, the Central Coast Ambient Monitoring Program, the Cooperative Monitoring Program, and the Low Impact Development Initiative are just a few examples of how coordinating and leveraging both internal and external resources has the potential to achieve tangible results on a regional scale.

Integrated Water Management Plan Summaries

Inclusion of the information contained in IRWMP's into the CWP regional reports has been a common suggestion by regional stakeholders at the regional outreach meetings since the inception of the IRWM program. To this end, the CWP update has taken on the task of summarizing readily available integrated water management plan in a consistent format for each of the regional reports. This collection of information will not be used to determine IRWM grant eligibility. ~~H~~s effort is ongoing and will be included in the final CWP updates and will include up to four pages for each IRWMP in the regional reports.

In addition to these summaries being used in the regional reports we intend to provide all of the summary sheets in one IRWMP Summary "Atlas" as an article included in Volume 4. This atlas will, under one cover, provide an "at-a-glance" understanding of each IRWM region and highlight each region's key water management accomplishments and challenges. The atlas will showcase how the dedicated efforts of individual regional water management groups (RWMGs) have individually and cumulatively transformed water management in California.

All IRWMPs are different in how they are organized. Therefore, finding and summarizing the content in a consistent way proved difficult. It became clear through these efforts that a process is needed to allow those with the most knowledge of the IRWMPs — those who were involved in the preparation — to have input on the summary. It is the intention that this process be initiated following release of Update 2013 and will continue to be part of the process of the update process for Update 2018. This process will also allow for continuous updating of the content of the atlas as new IRWMPs are released or existing IRWMPs are updated.

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44 Number: 1 Author: trachemm Subject: Cross-Out Date: 12/4/2013 8:54:32 AM

45 Number: 2 Author: trachemm Subject: Inserted Text Date: 12/4/2013 8:54:45 AM
Support implementation of

46 Number: 3 Author: georcook Subject: Inserted Text Date: 12/4/2013 4:17:15 PM
groundwater recharge with high quality surface water.

47 Number: 4 Author: trachemm Subject: Inserted Text Date: 12/4/2013 8:55:56 AM
Support adoption of

48 Number: 5 Author: trachemm Subject: Inserted Text Date: 12/4/2013 8:56:53 AM
that are protective of both groundwater and surface water.

49 Number: 6 Author: trachemm Subject: Inserted Text Date: 12/4/2013 8:57:10 AM
T

As can be seen in Figure CC-31, there are 7 IRWM planning efforts ongoing in the Central Coast Hydrologic Region.

PLACEHOLDER Figure CC-31 Integrated Water Management Planning in the Central Coast Hydrologic Region

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the report.]

Placeholder Text: At the time of the Public Review Draft the collection of information out of the IRWMPs in the region has not been completed. Below are the basic types of information this effort will summarize and present in the final regional report for each IRWMP available. An opportunity will be provided to those with responsibility over the IRWMP to review these summaries before the reports are final.

Region Description: This section will provide a basic description of the IRWM region. This would include location, major watersheds within the region, status of planning activity, and the governance of the IRWM. In addition, a IRWM grant funding summary will be provided.

Key Challenges: The top five challenges identified by the IRWM would be listed in this section.

Principal Goals/Objective: The top five goals and objectives identified in the IRWMP will be listed in this section.

Major IRWM Milestones and Achievements: Major milestones (Top 5) and achievements identified in the IRWMP would be listed in this section.

Water Supply and Demand: A description (one paragraph) of the mix of water supply relied upon in the region along with the current and future water demands contained in the IRWMP will be provided in this section.

Flood Management: A short (one paragraph) description of the challenges faced by the region and any actions identified by the IRWMP will be provided in this section.

Water Quality: A general characterization of the water quality challenges (one paragraph) will be provided in this section. Any identified actions in the IRWMP will also be listed.

Groundwater Management: The extent and management of groundwater (one paragraph) as described in the IRWMP will be contained in this section.

Environmental Stewardship: Environmental stewardship efforts identified in the IRWMP will be summarized (one paragraph) in this section.

Climate Change: Vulnerabilities to climate change identified in the IRWMP will be summarized (one paragraph) in this section.

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50 Number: 1 Author: trachemm Subject: Comment on Text Date: 12/4/2013 8:59:26 AM
Six IRWM regions are referenced in the rest of the document and we all agree that Ventura is primarily in the South Coast.

51 Number: 2 Author: trachemm Subject: Inserted Text Date: 12/4/2013 8:57:15 AM
6

52 Number: 3 Author: trachemm Subject: Inserted Text Date: 12/4/2013 8:57:39 AM
and implementation

Tribal Communities: Involvement with tribal communities in the IRWM will be described (one paragraph) in this section of each IRWMP summary.

Disadvantaged Communities: A summary (one paragraph) of the discussions on disadvantaged communities contained in the IRWMP will be included in this section of each IRWMP summary.

Governance: This section will include a description (less than one paragraph) of the type of governance the IRWM is organized under.

Resource Management Strategies

Volume 3 contains detailed information on the various strategies which can be used by water managers to meet their goals and objectives. A review of the resource management strategies addressed in the available IRWMP's are summarized in Table CC-28.

PLACEHOLDER Table CC-28 Resource Management Strategies addressed in IRWMP's in the Central Coast Hydrologic Region

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the report.]

Conjunctive Management and Groundwater Storage

Conjunctive management, or conjunctive use, refers to the coordinated and planned use and management of both surface water and groundwater resources to maximize the availability and reliability of water supplies in a region to meet various management objectives. Managing both resources together, rather than in isolation, allows water managers to use the advantages of both resources for maximum benefit. Conjunctive use of surface water and groundwater has been utilized for decades by numerous coastal and inland basins throughout the region. Many agencies have ~~erected systems of barriers~~ allow more efficient percolation of ephemeral runoff from surrounding mountains.

A survey undertaken in 2011-2012 jointly by DWR and ACWA to inventory and assess conjunctive management projects in California is summarized in Box CC-4. *More detailed information about the survey results and a statewide map of the conjunctive management projects and operational information, as of July 2012, is available online from Update 2013 Vol. 4 Reference Guide – California's Groundwater Update 2013.*

PLACEHOLDER Box CC-4 Statewide Conjunctive Management Inventory Effort in California

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the report.]

Conjunctive Management Inventory Results

Of the 89 agencies or programs identified as operating a conjunctive management or groundwater recharge program in California, five programs are located in the Central Coast Hydrologic Region. Two of the management agencies identified in the region reported the details of their conjunctive management program, as discussed below.

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53 Number: 1 Author: georcook Subject: Inserted Text Date: 12/4/2013 4:18:24 PM
, including recycled water,

54 Number: 2 Author: trachemm Subject: Inserted Text Date: 12/4/2013 9:02:07 AM
constructed instream recharge facilities

The Monterey Peninsula Water Management District conjunctive management program is listed as the Phase I Aquifer Storage and Recovery Project and was implemented in 1998 with a capital cost of $6.5 million. The project goals are to mitigate aquifer overdraft and saline intrusion into coastal basins, protect water quality, and meet regulatory requirements. The Aquifer Storage and Recovery project currently recharges approximately 5,300 acre-foot per year into Santa Margarita Aquifer and extracts approximately 3,000 acre-foot per year. The project has an annual operating cost of approximately $225,000.

The Pajaro Valley Water Management Agency's unnamed conjunctive management program is also an aquifer storage and recovery project which allows an annual recharge of approximately 700 acre-foot and extraction of approximately 170 acre-foot. Cumulatively, the project since inception has recharged an estimated 6,800 acre-foot and extracted an estimated 1,500 acre-foot. Similar to those of Monterey Peninsulas program, the goals of the Pajaro valley program are to mitigate overdraft and saline intrusion into coastal basins, protect water quality, and meet regulatory requirements. Costs associated with this program were not furnished.

Additional information regarding conjunctive management in California as well as discussion on associated benefits, costs, and issues can be found online from California Water Plan Update 2013 Vol. 3 Ch. 9 Conjunctive Management and Groundwater Storage Resource Management Strategy.

Regional Resource Management Strategies

The 27 Resources Management Strategies (RMS) included in *California Water Plan Update 2009* are intended to help water managers achieve the following six objectives:

1. Reduce Water Demand
2. Improve Operational Efficiency and Transfers
3. Increase Water Supply
4. Improve Water Quality
5. Practice Resource Stewardship
6. Improve Flood Management

~~Below, each Central Coast IRWM Region identifies current activities which address the 2009 RMSs.~~

~~**Santa Cruz**~~

- ~~**Agricultural Water Use Efficiency** – Under the County's new well ordinance, all new agricultural wells are required to develop and implement a water conservation plan as a condition of permit approval.~~
- ~~**Urban Water Use Efficiency** – Water districts within the Santa Cruz IRWM region have some of the lowest per-capita water use rates within the state and of the district's updated urban water management plans call out for conservation, and those programs are continually being updated and improved.~~
- ~~**Water Transfers** – The County, City of Santa Cruz, Soquel Creek Water District, Scotts Valley Water District and San Lorenzo Valley Water District are studying the feasibility of a water exchange project.~~
- ~~**Conjunctive Management & Groundwater Storage** – The County completed a conjunctive use analysis for the lower San Lorenzo River and identified three priority projects. This project laid the groundwork for the current water exchange project, described above.~~

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55 Number: 1 Author: georcook Subject: Highlight Date: 12/4/2013 5:00:43 PM

Add the following paragraph: The Santa Clara Valley Water District has been a leader in conjunctive use since the 1930s. Initially, the District supplemented natural groundwater recharge through the managed recharge of local supplies. As the county continued to grow, so did the variety of managed groundwater recharge sources and methods. When local surface water supplies could no longer meet the growing county's needs, the District turned to imported water for recharge. Managed recharge is estimated to be 24,000 AF per year in the Llagas Subbasin (SCVWD, 2012 Groundwater Management Plan. http://www.valleywater.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=8467).

56 Number: 2 Author: trachemm Subject: Comment on Text Date: 12/4/2013 9:04:06 AM

There should be an explanation as to why the 2009 CWP is being referenced rather than the 2013 CWP.

57 Number: 3 Author: trachemm Subject: Cross-Out Date: 12/4/2013 9:08:30 AM

This is too much information, especially if it is completed to document what is going on in the other IRWM regions. The key information for each region will be summarized in the Figures for CC-31 and the Table CC-28 is sufficient to document the RMS for each region. If this information isn't deleted, then it should be augmented to include all the regions.

- **Desalination** – The City of Santa Cruz has partnered with the Soquel Creek Water District to complete a rigorous and successful analysis of a potential desalination plant.
- **Recycled Municipal Water** – The City of Scotts Valley and the Scotts Valley Water District operate an expanded facility that provides recycled water for landscape irrigation to reduce groundwater pumping. A project is currently being pursued with local funding to recycle the balance of Scotts Valley wastewater for irrigation on a nearby golf course, which will reduce the demand for municipal water.
- **Drinking Water Treatment and Distribution** – The City of Santa Cruz and San Lorenzo Valley Water District operate a centralized water treatment plant to treat surface water prior to distribution. The other water agencies typically utilize wellhead treatment at their individual wells prior to distribution.
- **Groundwater/Aquifer Remediation** – Santa Cruz County Environmental Health Service has a comprehensive program to assist the Central Coast Regional Water Quality Control Board in the cleanup of contaminated groundwater, particularly in the Scotts Valley area, where contamination plumes pose potential threats to municipal wells.
- **Pollution Prevention** – Almost all local jurisdictions are implementing pollution prevention efforts, and most of this work is being done under NPDES stormwater permits.
- **Urban Runoff Management** – Same as for pollution prevention.
- **Agricultural Lands Stewardship** – Many agricultural operations within the region conduct agricultural land stewardship under the Monterey Bay National Marine Sanctuary's Ag and Rural Lands plan, supported by Federal 319(h) and State Proposition 13, 40, 50 and 84 grants. The Resource Conservation District of Santa Cruz County, the Natural Resources Conservation Service, and willing landowners have also implemented projects.
- **Economic Incentives** – Water agencies utilize tiered pricing and rebates to encourage water conservation.
- **Ecosystem Restoration** – The Resource Conservation District of Santa Cruz County coordinates many restoration activities in the region, including the Healthy Watersheds Restoration Program (HWRP), and the Integrated Watershed Restoration Program (IWRP).
- **Forest and Watershed Management** – The City of Santa Cruz and San Lorenzo Valley Water District both own extensive forested watershed lands, and have developed watershed management plans to improve the watershed and limit potential impacts of timber harvesting.
- **Land Use Planning and Management** – The Santa Cruz County General Plan includes policies and programs for water resource, watershed, aquifer protection, including restrictions in mapped groundwater recharge areas and water supply watersheds. Santa Cruz County has ordinances for protection of riparian corridors and erosion control as well as pollution prevention.
- **Recharge Area Protection** – Santa Cruz County has mapped primary groundwater recharge areas and has specific policies for minimum parcel size, septic system design and maintenance of infiltration in those areas.
- **Water-dependent Recreation** – The region supports boating and fishing in Loch Lomond; white-water boating, salmon and steelhead fishing, swimming and wading in the San Lorenzo River; and swimming, surfing and boating in the near-coastal waters.
- **Flood Risk Management** – Active flood risk management includes flood plain zoning and development restrictions; operation of an ALERT flood warning system; reconstruction projects to raise bridges on the San Lorenzo River and Soquel Creek; levee reconstruction and

Number: 1 Author: trachemm Subject: Cross-Out Date: 12/4/2013 9:04:23 AM

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maintenance on the lower San Lorenzo River; and grants to elevate flood-prone homes in the Felton area.

Greater Monterey

- **Agricultural Water Use Efficiency** - The Resource Conservation District (RCD) of Monterey County works with farmers to increase agricultural water use efficiency through BMPs such as use of a time clock/pressure switch, water flowmeters, leakage reduction, sprinkler improvements, pre-irrigation reduction, reduced sprinkler spacing, micro-irrigation systems, land leveling/grading, and soil moisture sensors.
- **System Re-operation** - The Salinas Valley Water Project, implemented by the Monterey County Water Resources Agency (MCWRA) in April 2010, involves re-operation of the Nacimiento and San Antonio Reservoirs to provide additional water to the Salinas Valley which is then used for both groundwater basin recharge and for blending with recycled water. The blended water replaces some of the groundwater pumped for irrigation. Together, increased groundwater recharge and the use of recycled water for irrigation have helped to reduce seawater intrusion.
- **Recycled Municipal Water** - The City of Soledad completed construction of the new Soledad Water Reclamation Facility, with a capacity of 5.5 million gallons/day (MGD), at its wastewater treatment plant in February 2010. The City plans to also construct a recycled water pump station and additional recycled water transmission mains, which will enable delivery of recycled water to multiple landscaped areas currently being irrigated with potable water.
- **Watershed Management/Planning** - The Monterey County RCD is drafting a watershed management plan for the Big Sur River watershed.

San Luis Obispo

- **Reduce Water Demand** through conservation.
- **Increase Water Supply** through optimizing use of the Nacimiento Water Project and State Water Project; increasing recycled water use; groundwater banking and recharge; desalination; new off-stream and on-stream storage; and precipitation enhancement .
- **Practice Resource Stewardship** through improved Land Use Management.
- **Improve Operational Efficiency and Transfers** through Salinas Reservoir and Lopez Lake expansion and exchanges, as well as optimization of Nipomo supplemental water project.

Climate Change

For over two decades, the State and federal governments have been preparing for climate change effects on natural and built systems with a strong emphasis on water supply. Climate change is already impacting many resource sectors in California, including water, transportation and energy infrastructure, public health, biodiversity, and agriculture (USGRCP, 2009; CNRA, 2009). Climate model simulations based on the Intergovernmental Panel on Climate Change's 21st century scenarios project increasing temperatures in California, with greater increases in the summer. Projected changes in annual precipitation patterns in California will result in changes to surface runoff timing, volume, and type (Cayan, 2008). Recently developed computer downscaling techniques indicate that California flood risks from warm-wet, atmospheric river type storms may increase beyond those that we have known historically, mostly in the form of occasional more-extreme-than-historical storm seasons (Dettinger, 2011).

Currently, enough data exist to warrant the importance of contingency plans, mitigation (i.e., reduction) of greenhouse gas (GHG) emissions, and incorporating adaptation strategies (i.e., methodologies and

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Number: 1 Author: trachemm Subject: Cross-Out Date: 12/4/2013 9:04:23 AM

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Precipitation projections from climate models for California are not all in agreement, but most anticipate drier conditions in the southern part of California, with heavier and warmer winter precipitation in the north (Pierce, et al., 2012). Because there is less scientific detail on localized precipitation changes, there exists a need to adapt to this uncertainty at the regional level (Qian, et al., 2010).

The National Research Council has projected that sea level will rise approximately 2-12 inches (4-30 cm) by 2030, 5-24 inches (12-61 cm) by 2050 and 17-66 inches (42-167 cm) by 2100 ((National Research Council [NRC], 2012)). For the Central Coast, approximately 36 percent of the region's water comes from groundwater, and salt water intrusion into the coastal groundwater aquifers is a current and historical problem. It is likely that, as sea level continues to rise and groundwater continues to be extracted, this problem will be exacerbated (Cal-EMA/CNRA, 2012).

Critical habitats in the region such as near-shore ecosystems and estuaries will be impacted by sea level rise. Coastal infrastructure will be particularly vulnerable to increased storm surges. For Central Coast counties, the estimated increase in acreage vulnerable to flooding is 36 percent in Santa Barbara, 15 percent in San Luis Obispo, 12 percent in Santa Cruz, and 11 percent in Monterey (Cal-EMA/CNRA, 2012). It is anticipated that these storm surge events, which will result in flooding and erosion, will be more damaging to the coastline than the gradual sea level rise that California is experiencing, and these changes to the coastline will likely have a significant economic impact on the region’s coastal tourism industry (CNRA, 2009).

Agricultural crops in the region, particularly wine and table grapes, almonds, and avocadoes, will be affected by the increase in average temperatures as well as variations in the timing and amount of precipitation (USGRCP 2009). For the Central Coast, approximately 30% of the region's drinking and irrigation water comes from groundwater, and salt water intrusion into the coastal groundwater aquifers is a current and historical problem. As sea level continues to rise and groundwater continues to be extracted, this problem may be exacerbated (CNRA, 2012). Heat waves, defined as five days over 79 to 85 degrees along the coast and 99 to 101 degrees F inland, are expected to occur three to four more times inland by 2050. By 2100, they are expected to occur four to eight times more often in coastal areas and eight to ten times more often in inland areas (Cal-EMA/CNRA 2012). Wildfire risk will increase, with as much as a 200-350% increase in the area burned in 2085 compared to historic amounts (Westerling, 2009).

Adaptation

Climate change has the potential to impact the region, which the state depends upon for its economic and environmental benefits. These changes will increase the vulnerability of natural and built systems in the region. Impacts to natural systems will challenge aquatic and terrestrial species with diminished water quantity and quality, and shifting eco-regions. Built systems will be impacted by changing hydrology and runoff timing, loss of natural snowpack storage, making the region more dependent on surface storage in reservoirs and groundwater sources. Increased future water demand for both natural and built systems may be particularly challenging with less natural storage and less overall supply.

The Central Coast Hydrologic Region contains a diverse landscape with different climate zones, making it difficult to find one-size-fits-all adaptation strategies. Water managers and local agencies must work together to determine the appropriate planning approach for their operations and communities. While climate change adds another layer of uncertainty to water planning, it does not fundamentally alter the

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60 Number: 1 Author: trachemm Subject: Highlight Date: 12/4/2013 9:09:54 AM
Line 21 on this page says 80% of drinking and irrigation was is from groundwater. Why the difference?

61 Number: 2 Author: trachemm Subject: Highlight Date: 12/4/2013 9:09:02 AM

62 Number: 3 Author: trachemm Subject: Comment on Text Date: 12/4/2013 9:10:46 AM
The general information should be deleted/moved to a different volume. This should focus on the Central Coast.

- Precipitation Enhancement.
- Surface Storage – Regional/Local.
- Pollution Prevention.
- Agricultural Land Stewardship.
- Ecosystem Restoration.
- Forest Management.
- Land Use Planning and Management.
- Recharge Area Protection.
- Watershed Management.
- Flood Risk and Integrated Flood Management.

The myriad of resources and choices available to managers can seem overwhelming, and the need to take action given uncertain future conditions is daunting. However, there are many 'low-regrets' actions that water managers in the Central Coast Hydrologic Region can take to prepare for climate change, regardless of the magnitude of future warming (GEOS/LGC, 2010). These actions often provide economic and public health co-benefits. Water and energy conservation are examples of strategies that make sense with or without the additional pressures of climate change. For the Central Coast region, developing adaptive management plans to address the impacts of sea level rise on groundwater supplies and coastal geomorphology should serve to facilitate the gradual land-ward retreat of the region's vulnerable coastal municipal and urban infrastructure (DWR, 2008; Cal-EMA and CNRA, 2012).

Water managers need to consider both the natural and built environments as they plan for the future. Stewardship of natural areas and protection of biodiversity are critical for maintaining ecosystem services important for human society such as flood management, carbon sequestration, storm water pollution remediation, as well as, habitat for the pollinators of our natural and agricultural landscapes. Increased cross-sector collaboration between water managers, land use planners and ecosystem managers provides opportunities for identifying common goals and actions needed to achieve resilience to climate change and other stressors.

Mitigation

California's water sector has a large energy footprint, consuming 7.7% of statewide electricity (CPUC, 2010). Energy is used in the water sector to extract, convey, treat, distribute, use, condition, and dis-pose of water. Figure 3-26, Water-Energy Connection in Volume 1, CA Water Today shows all of the connections between water and energy in the water sector; both water use for energy generation and energy use for water supply activities. The regional reports in Update 2013 are the first to provide detailed information on the water-energy connection, including energy intensity (EI) information at the regional level. This EI information is designed to help inform the public and water utility managers about the relative energy requirements of the major water supplies used to meet demand. Since energy usage is related to Greenhouse Gas (GHG) emissions, this information can support measures to reduce GHG's, as mandated by the State.

Figure CC-32 shows the amount of energy associated with the extraction and conveyance of 1 acre-foot of water for each of the major sources in this region. The quantity used is also included, as a percent. For reference, Figure 3-26, Water-Energy Connection in CA Water Today, Volume 1 highlights which water-energy connections are illustrated in Figure CC-32; only extraction and conveyance of raw water. Energy required for water treatment, distribution, and end uses of the water are not included. Not all water types

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63 Number: 1 Author: trachemm Subject: Comment on Text Date: 12/4/2013 9:11:10 AM
The general information should be deleted/moved to a different volume. This should focus on the Central Coast.

Table CC-2 Number of Well Logs by County and Use for the Central Coast Hydrologic Region (1977-2010)

County	Total Number of Well Logs by Well Use						
	Domestic	Irrigation	Public Supply	Industrial	Monitoring	Other	Total Well Records
Santa Cruz	2,514	304	47	6	904	915	4,690
San Benito	689	255	19	5	320	428	1,716
Monterey	3,808	1,472	149	15	1,535	2,112	9,091
San Luis Obispo	8,387	1,087	181	22	1,027	522	11,226
Santa Barbara	1,739	731	105	32	1,094	503	4,204
Total Well Records	17,137	3,849	501	80	4,880	4,480	30,927

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64 Number: 1 Author: georcook Subject: Comment on Text Date: 12/5/2013 9:57:34 AM
Add footnote table that wells from Llagas Subbasin are not included in this table, but are included in the SF regional report

Table CC-3 CASGEM Groundwater Basin Prioritization for the Central Coast Hydrologic Region

Basin Prioritization	Count	Basin/Subbasin Number	Basin Name	Subbasin Name	2010 Census Population
High	1	3-4.02	Salinas Valley	East Side Aquifer	128,646
High	2	3-4.01	Salinas Valley	180/400 Foot Aquifer	55,740
	4				
High	3	3-2	Pajaro Valley		114,282
High	4	3-7	Carmel Valley		5,086
High	5	3-1	Soquel Valley		18,634
High	6	3-12	Santa Maria Valley		201,759
High	7	3-8	Los Osos Valley		13,948
High	8	3-4.06	Salinas Valley	Paso Robles Area	56,077
Medium	1	3-4.08	Salinas Valley	Seaside Area	65,899
Medium	2	3-26	West Santa Cruz Terrace		70,336
Medium	3	3-16	Goleta		47,252
Medium	4	3-3.01	Gilroy-Hollister Valley	Llàgas Area	91,706
Medium	5	3-17	Santa Barbara		63,966
Medium	6	3-9	San Luis Obispo Valley		18,834
Medium	7	3-4.09	Salinas Valley	Langley Area	9,833
Medium	8	3-4.04	Salinas Valley	Forebay Aquifer	43,867
Medium	9	3-4.10	Salinas Valley	Corral de Tierra Area	7,831
Medium	10	3-3.04	Gilroy-Hollister Valley	San Juan Bautista Area	26,150
Medium	11	3-15	Santa Ynez River Valley		75,460
Medium	12	3-3.03	Gilroy-Hollister Valley	Hollister Area	22,013
Medium	13	3-3.02	Gilroy-Hollister Valley	Bolsa Area	2,935
Medium	14	3-49	Montecito		9,885
Medium	15	3-4.05	Salinas Valley	Upper Valley Aquifer	15,862
Medium	16	3-14	San Antonio Creek Valley		2,279
Medium	17	3-21	Santa Cruz Purisima Formation		17,963
Low	1	3-13	Cuyama Valley		1,236

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65 Number: 1 Author: georcook Subject: Highlight Date: 12/2/2013 2:15:15 PM
SCVWD recommends providing footnote to table that describes meaning of high, medium, low, and very low.

Table CC-4 Groundwater Level Monitoring Wells by Monitoring Entity in the Central Coast Hydrologic Region

State and Federal Agencies	Number of Wells
USGS	414
Total State and Federal Wells:	**414**
Monitoring Cooperators	**Number of Wells**
Santa Barbara County Flood Control and Water Conservation District	23
City of Santa Barbara	68
Santa Maria Valley Water Conservation District	21
Ventura County Flood Control District	2
Total Cooperator Wells:	**114**
CASGEM Monitoring Entities	**Number of Wells**
Carpinteria Valley Water District	12
Monterey Peninsula Water Management District	38
San Benito County Water District	123
Santa Cruz County Environmental Health Services	116
Total CASGEM Monitoring Entities:	**289**
Grand Total:	**817**

Note: Table includes groundwater level monitoring wells having publically available online data. DWR currently monitors 70 wells in the Central Coast Hydrologic Region; however, not all of these data are publicly available due to privacy agreements with well owners or operators.

Table represents monitoring information as of July, 2012

66 Number: 1 Author: georcook Subject: Highlight Date: 12/2/2013 2:59:43 PM
Santa Clara Valley Water District is the designated Monitoring Entity for the Llagas Subbasin with 13 wells.

Table CC-9 Population Estimates and Decadal Projections for the Central Coast

Region	Estimates		Projections			
	2000	2010	2020	2030	2040	2050
State of California	34,000,835	37,312,510	40,817,839	44,574,756	47,983,659	51,013,984
Monterey	402,854	415,758	436,275	459,359	483,868	511,956
San Benito	53,635	55,341	57,138	59,259	61,032	62,217
San Luis Obispo	247,724	269,710	290,132	311,388	328,786	344,805
Santa Barbara	399,874	424,223	448,986	469,070	485,777	501,283
Santa Cruz	255,869	263,132	270,776	278,008	281,053	283,108
Total for Hydrologic Region	1,359,956	1,428,164	1,503,307	1,577,084	1,640,515	1,703,370

Note: Population estimates and projections prepared by Demographic Research Unit, CA Department of Finance, May 2012; does not include Santa Clara or San Mateo Counties. From: http://www.dof.ca.gov/research/demographic/reports/projections/interim/view.php.

67 Number: 1 Author: trachemm Subject: Comment on Text Date: 12/4/2013 9:13:35 AM
Need to add data for Santa Clara County

Table CC-14 Central Coast Hydrologic Region Average Annual Groundwater Supply by County and by Type of Use (2005-2010)

Central Coast Hydrologic Region	Agriculture Use Met by Groundwater		Urban Use Met by Groundwater		Managed Wetlands Use Met by Groundwater		Total Water Use Met by Groundwater	
County	**TAF**	**%**	**TAF**	**%**	**TAF**	**%**	**TAF**	**%**
Santa Cruz	17.6	98%	28.9	71%	0.0	0%	46.5	79%
San Benito	48.2	74%	7.7	70%	0.0	0%	55.9	73%
Monterey	464.2	99%	67.1	100%	0.0	0%	531.3	99%
San Luis Obispo	161.2	97%	39.0	74%	0.0	0%	200.3	92%
Santa Barbara	186.6	87%	42.1	48%	0.0	0%	228.7	76%
2005-10 Annual Ave. Total:	877.8	94%	184.8	72%	0.0	0%	1,062.6	89%

Note: 1) TAF = thousand acre-feet

2) Percent use is the percent of the total water supply that is met by groundwater, by type of use

3) 2005-10 Precipitation equals 94% of the 30-yr average for the Central Coast Hydrologic Region

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68 Number: 1 Author: trachemm Subject: Comment on Text Date: 12/4/2013 9:14:05 AM
Missing Santa Clara

Table CC-16 Urban Water Suppliers by IRWM Region

IRWM Region	Urban Water Suppliers	2010 Water Use Acre-feet/ Year
Santa Cruz	Scotts Valley Water District	2,079
	Soquel Creek Water District	4,986
	Santa Cruz City of	11,555
1anta Cruz/Pajaro River Watershed	Watsonville City of	7,658
Pajaro River Watershed	Morgan Hill City of	9,096
	Gilroy City of	9,078
Greater Monterey	California Water Service Co. King City	2,075
	California Water Service Co. Salinas District	22,057
	Soledad, City of	2,680
	Marina Coast Water District	4,795
Monterey Peninsula	California-American Water Co. Monterey District	16,033
San Luis Obispo	Paso Robles City of	8,118
	Nipomo Community Services District	3,266
	Pismo Beach City of	2,029
	Arroyo Grande City of	3,521
	Grover Beach City of	2,140
	Morro Bay City of	1,485
	San Luis Obispo City of	6,267
	Cambria Community Services District	757
Santa Barbara Countywide	Golden State Water Co. Orcutt	8,925
	Santa Maria City of	16,504
	Santa Barbara City of	13,107
	Carpinteria Valley Water District	2,137
	Lompoc City of	5,509
	Goleta Water District	11,590

Data from Urban Water Management Plans, as submitted to DWR, 2012.

69 Number: 1 Author: trachemm Subject: Cross-Out Date: 12/4/2013 9:14:57 AM
~~The~~ City of Watsonville is in the Pajaro region.

Map Label	Agency Name	Date	County	Basin Number	Basin Name
					Non-B118 Basin
CC-7	Montecito Water District	1998	Santa Barbara	3-49	Montecito
	No signatories on file				
CC-8	Water Resources Association of San Benito County	2004	San Benito	3-3.02	Bolsa Area
				3-3.03	Hollister Area
				3-3.04	San Juan Bautista Area
				3-25	Tres Pinos Valley
1F-2	Santa Clara Valley Water District	~~2001~~, 2	Santa Clara	2-9.02	Santa Clara Subbasin
	3o signatories on file			3-3.01	Llagas Subbasin

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70 Number: 1 Author: georcook Subject: Highlight Date: 12/4/2013 5:04:13 PM
Santa Clara Valley Water District completed, and its Board adopted, an updated Groundwater Management Plan in 2012 (http://www.valleywater.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=8467)

71 Number: 2 Author: BehzAhma Subject: Inserted Text Date: 12/4/2013 2:38:12 PM
2012

72 Number: 3 Author: georcook Subject: Comment on Text Date: 12/4/2013 5:05:54 PM
It is not clear what signatories is referring to. The 2012 Groundwater Management Plan (http://www.valleywater.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=8467) was adopted by the Board, no other signatures were required.

Table CC-19 Assessment for SB 1938 GWMP Required Components, SB 1938 GWMP Voluntary Components, and Bulletin 118-03 Recommended Components

SB 1938 GWMP Required Components	Percent of plans that meet requirement
Basin Management Objectives	50%
BMO: Monitoring/Management Groundwater Levels	75%
BMO: Monitoring Groundwater Quality	75%
BMO: Inelastic Subsidence	75%
BMO: SW/GW Interaction & Affects to Groundwater Levels & Quality	75%
Agency Cooperation	100%
Map	75%
Map: Groundwater basin area	100%
Map: Area of local agency	100%
Map: Boundaries of other local agencies	75%
Recharge Areas (1/1/2013)	Not Assessed
Monitoring Protocols	50%
MP: Changes in groundwater levels	100%
MP: Changes in groundwater quality	100%
MP: Subsidence	75%
MP: SW/GW Interaction & Affects to Groundwater Levels & Quality	75%
SB 1938 GWMP Voluntary Components	**Percent of plans that include component**
Saline Intrusion	75%
Wellhead Protection & Recharge	100%
Groundwater Contamination	75%
Well Abandonment & Destruction	75%
Overdraft	100%
Groundwater Extraction & Replenishment	100%
Monitoring	100%
Conjunctive Use Operations	100%
Well Construction Policies	75%
Construction and Operation	100%
Regulatory Agencies	25%
Land Use	50%
Bulletin 118-03 Recommended Components	**Percent of plans that include component**
GWMP Guidance	50%
Management Area	100%
BMOs, Goals, & Actions	100%
Monitoring Plan Description	75%
IRWM Planning	100%
GWMP Implementation	100%
GWMP Evaluation	100%

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73 Number: 1 Author: georcook Subject: Highlight Date: 12/2/2013 3:53:44 PM
This table needs to be updated to include the 2012 Groundwater Management Plan by SCVWD.

Table CC-22 Groundwater Ordinances that Apply to Counties in the Central Coast Hydrologic Region

County	Groundwater Management	Guidance Committees	Export Permits	Recharge	Well Abandonment & Destruction	Well Construction Policies
Monterey	-	-	-	-	Y	Y
San Benito	-	-	Y	Y	Y	Y
San Luis Obispo	-	-	-	-	-	Y
San Mateo	-	-	-	-	Y	Y
Santa Barbara	-	-	-	-	-	Y
Santa Clara	[1][2]	-	-	-	[1][3]	[1][4]
Santa Cruz	-	-	-	-	Y	Y
Ventura	-	-	-	-	Y	Y

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74 Number: 1 Author: georcook Subject: Comment on Text Date: 12/5/2013 9:59:08 AM
Ordinances 89-1 (Groundwater Management) and 90-1 (Well Construction and Destruction) were adopted by Santa Clara Valley Water District Board of Directors and should be reflected in this table.

75 Number: 2 Author: georcook Subject: Inserted Text Date: 12/4/2013 5:07:02 PM
Y

76 Number: 3 Author: georcook Subject: Inserted Text Date: 12/4/2013 5:06:24 PM
Y

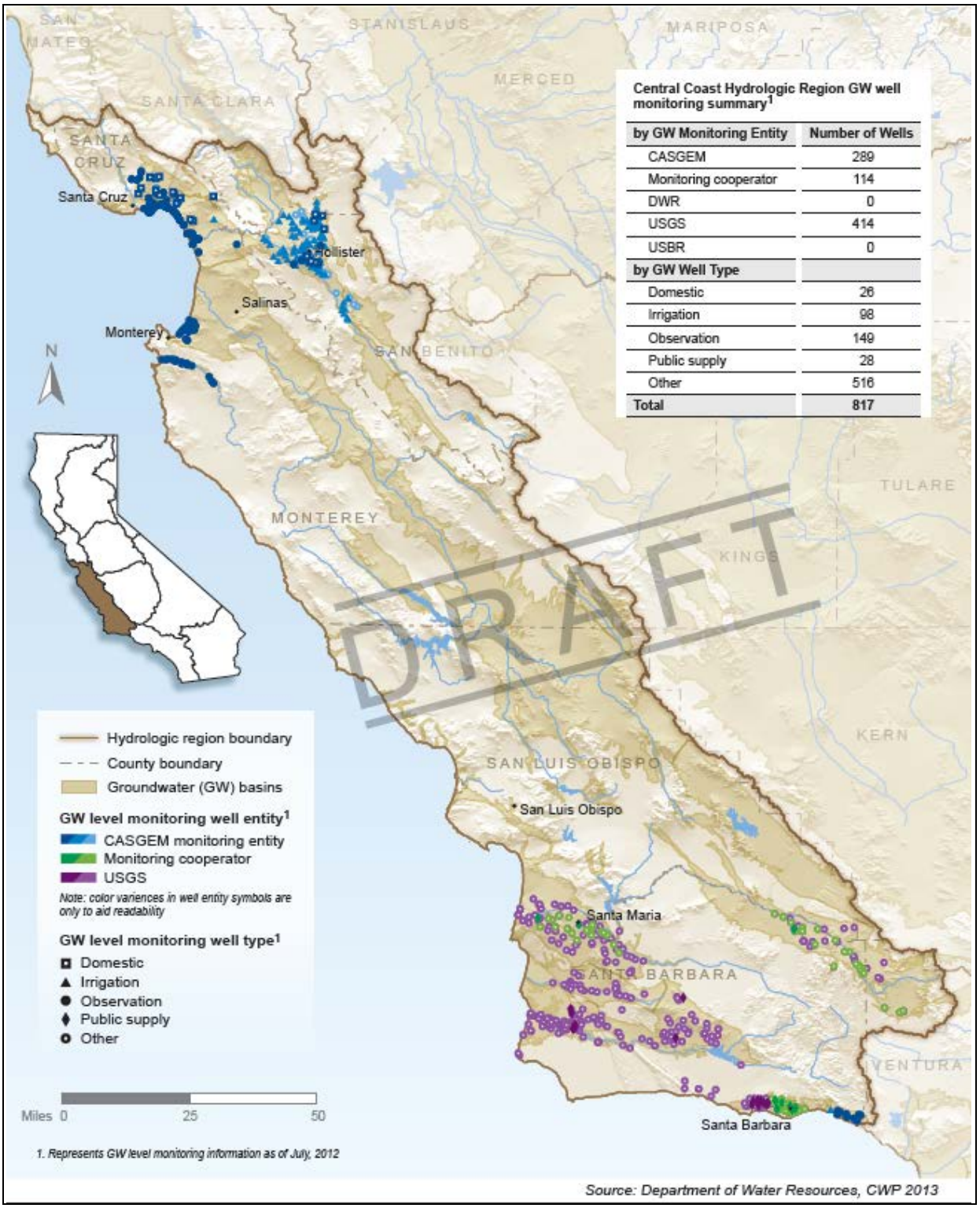
77 Number: 4 Author: georcook Subject: Inserted Text Date: 12/4/2013 5:06:38 PM
Y

Table CC-28 Resource Management Strategies Addressed in IRWMP's in the Central Coast Hydrologic Region

Resource Management Strategy	IRWMP 1	IRWMP 2
Agricultural Water Use Efficiency		
Urban Water Use Efficiency		
Conveyance – Delta		
Conveyance – Regional/Local		
System Reoperation		
Water Transfers		
Conjunctive Management & Groundwater		
Desalination		
Precipitation Enhancement		
Recycled Municipal Water		
Surface Storage – CALFED		
Surface Storage – Regional/Local		
Drinking Water Treatment and Distribution		
Groundwater and Aquifer Remediation		
Match Water Quality to Use		
Pollution Prevention		
Salt and Salinity Management		
Agricultural Lands Stewardship		
Economic Incentives		
Ecosystem Restoration		
Forest Management		
Land Use Planning and Management		
Recharge Areas Protection		
Water-Dependent Recreation		
Watershed Management		
Flood Risk Management		
Flood Management		
Desalination (Brackish and Sea Water)		
Salt and Salinity Management		

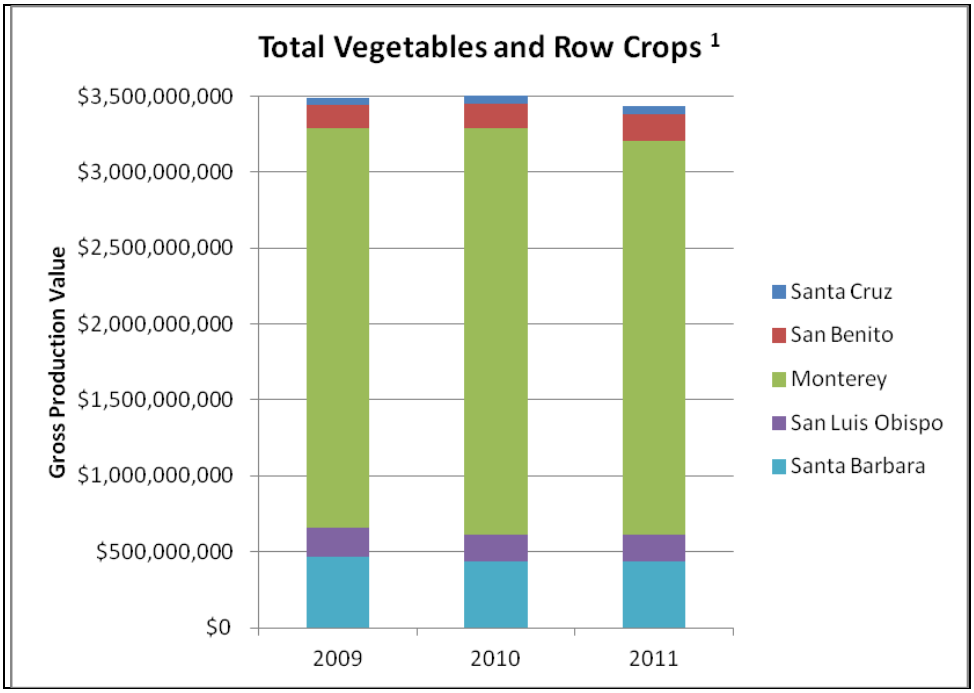
78 Number: 1 Author: trachemm Subject: Comment on Text Date: 12/4/2013 9:16:52 AM
Table should be completed for each IRWMP.

Figure CC-9 Monitoring Well Location by Agency, Monitoring Cooperator, and CASGEM Monitoring Entity in the Central Coast Hydrologic Region



79 Number: 1 Author: georcook Subject: Highlight Date: 12/2/2013 4:01:11 PM
SCVWD is the designated monitoring entity for the Llagas Subbasin. This figure should be updated to include the 13 wells monitored by SCVWD.

Figure CC-12 Central Coast Total Vegetables and Row Crops



[1] Total vegetable and row crops can include: Arugula, Anise, Artichokes, Asparagus, Beans, Beets, Bok Choy, Borage, Broccoli, Brussel Sprouts, Cabbage, Carrots, Cantaloupe, Cauliflower, Celery, Chicory, Chard, Chili Peppers, Cilantro, Collards, Corn, Cucumbers, Daikon, Dandelion, Dill, Eggplant, Endive, Escarole, Fennel, Garlic, Green Onions, Garbanzo Beans, Herbs, Kale, Kohlrabi, Leeks, Lettuces, Melons, Mushrooms, Mizuna, Mustard, Okra, Onions, Parsley, Parsnips, Peas, Pepper, Potatoes, Pumpkins, Radicchio, Radishes, Rutabagas, Shallots, Spinach, Squash, Sweet Corn, Tomato, Tomatillo, Turnips, and Watermelon.

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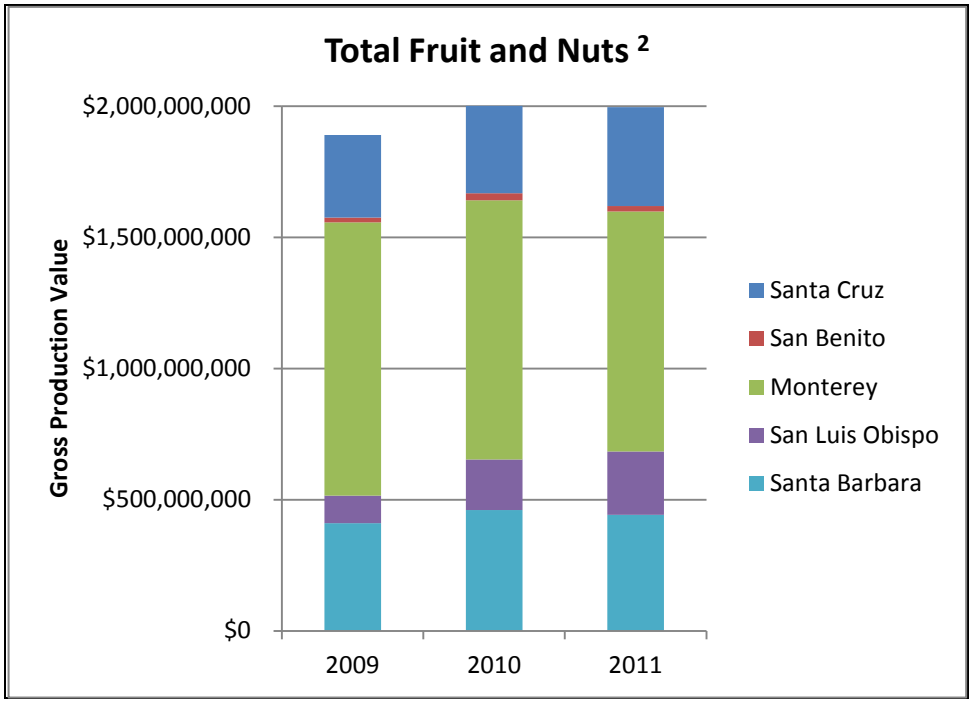
80 Number: 1 Author: trachemm Subject: Comment on Text Date: 12/4/2013 9:24:10 AM
Need to add Santa Clara.

Figure CC-13 [1] Central Coast Total Fruit and Nuts



[2] Total fruit and nuts can include: Almonds, Apples, Apricots, Asian Pears, Avocados, Blackberries, Blueberries, Cherries, Feijoas, Figs, Grapefruit, Kiwis, Lemons, Limes, Mandarin Oranges, Navel Oranges, Nectarines, Olives, Passion Fruit, Peaches, Pears, Persimmons, Pistachios, Plums, Pluot, Pomegranates, Prunes, Raspberries, Specialty Citrus, Table Grapes, Tangerines, Table Grapes, and Walnuts.

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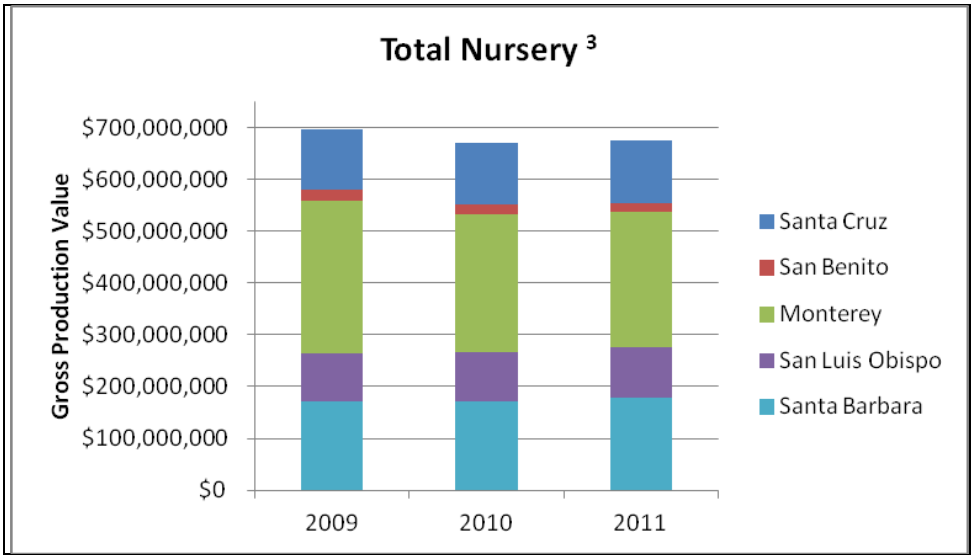
81 Number: 1 Author: trachemm Subject: Comment on Text Date: 12/4/2013 9:24:27 AM
Need to add Santa Clara.

Figure CC-14 Central Coast Total Nursery[1]



[3] Total nursery can include: Aquatic plants, Bulbs, Cacti, Christmas trees, Farm stock transplants, Flowers, Flower seeds, Fruit-Nut trees, Herbs, Indoor potted plants, Landscape plants, Propagative plants, Scion wood, Specialty plants, Succulents, and Turf.

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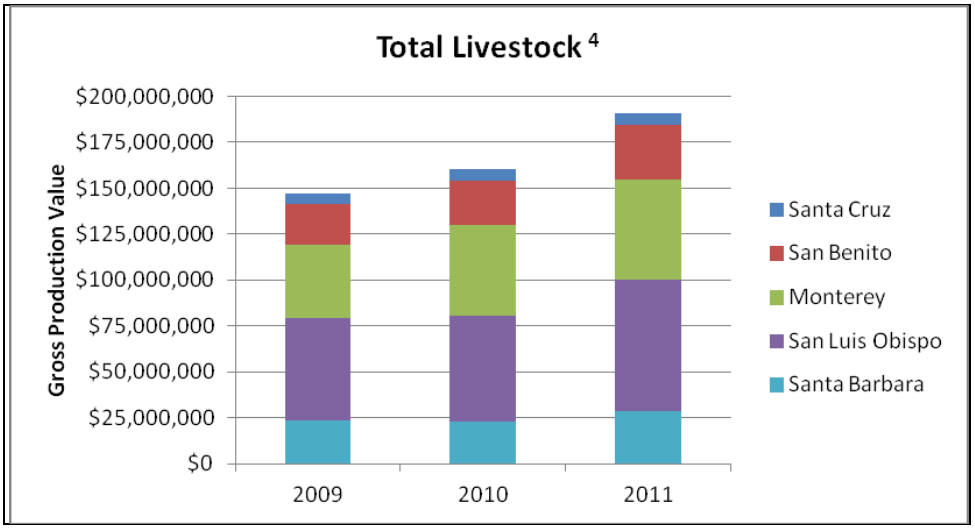
82 Number: 1 Author: trachemm Subject: Comment on Text Date: 12/4/2013 9:24:34 AM
Need to add Santa Clara.

Figure CC-15 Central Coast Total Livestock[1]



[4] Total Livestock can include: All cattle, chicken, eggs, goats, hogs, lambs, milk, turkey, and wool.

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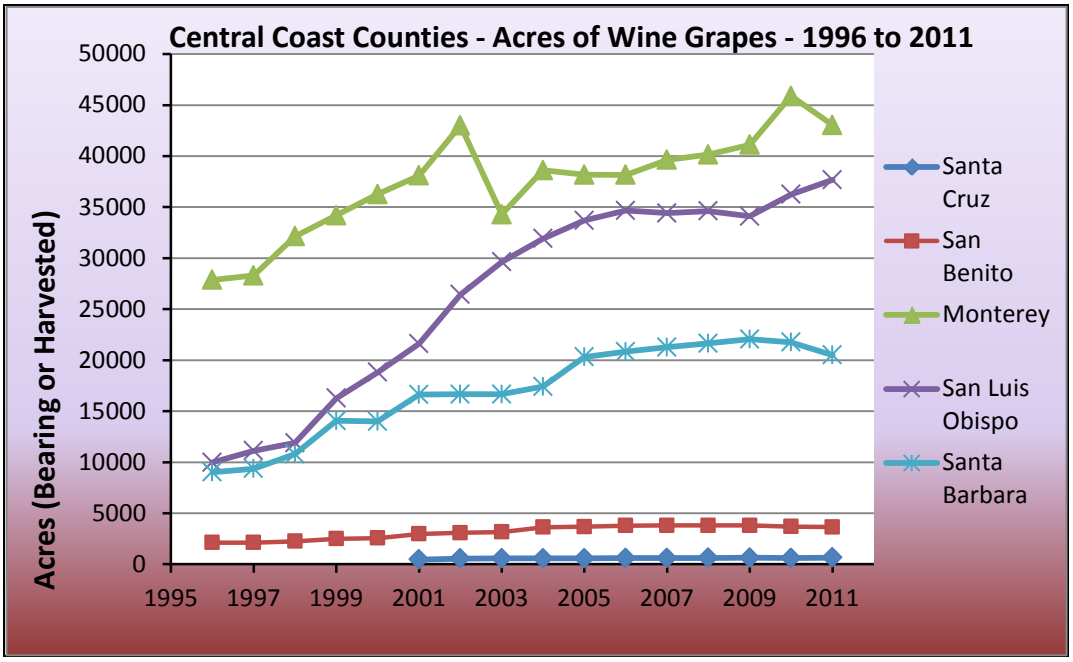
83 Number: 1 Author: trachemm Subject: Comment on Text Date: 12/4/2013 9:24:41 AM
Need to add Santa Clara.

Figure CC-16 Central Coast Acres of Wine Grapes over Time



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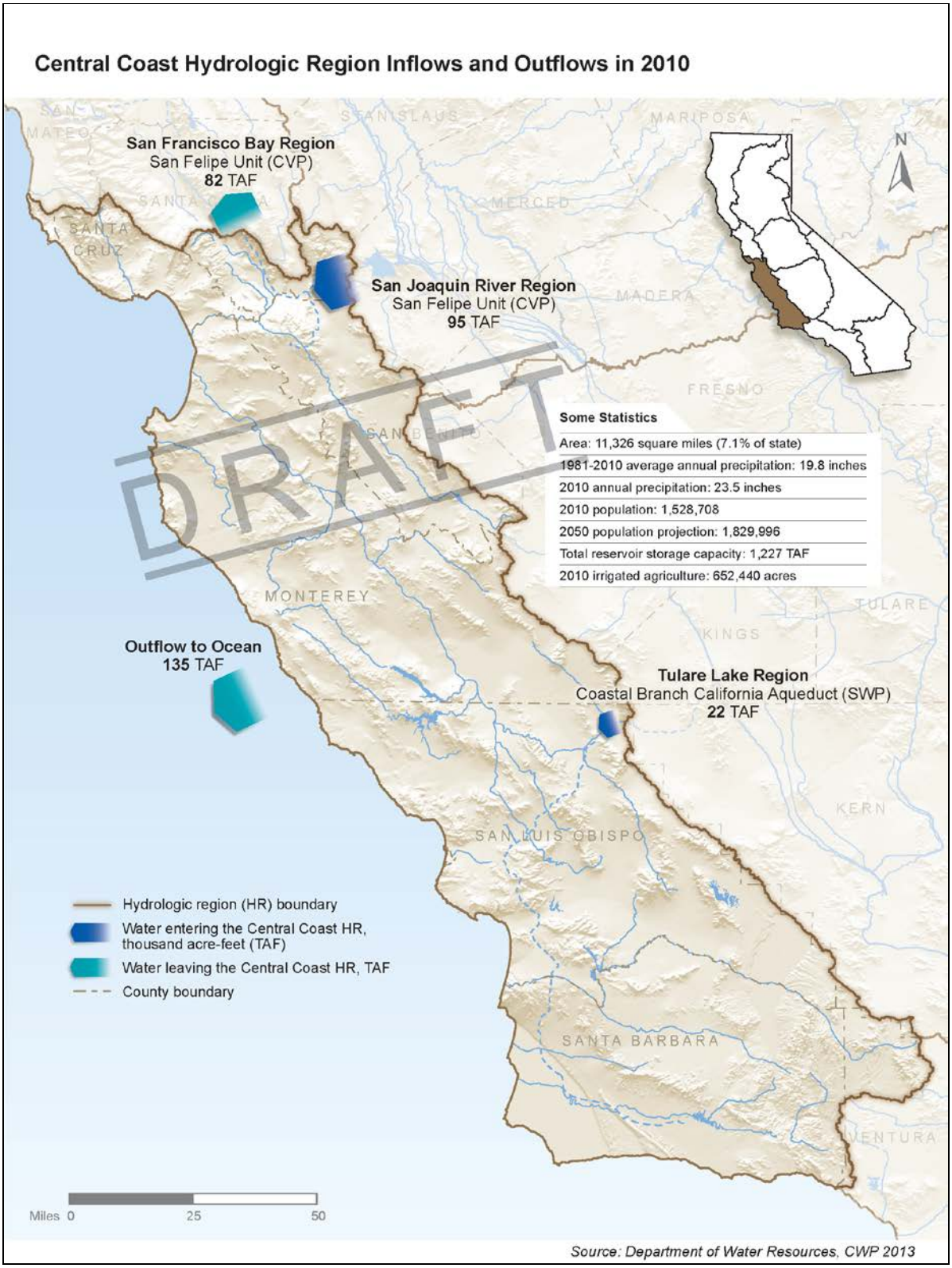
84 Number: 1 Author: trachemm Subject: Comment on Text Date: 12/4/2013 9:25:04 AM
Need to add Santa Clara.

Figure CC-17 Central Coast Hydrologic Region Inflows and Outflows in 2010



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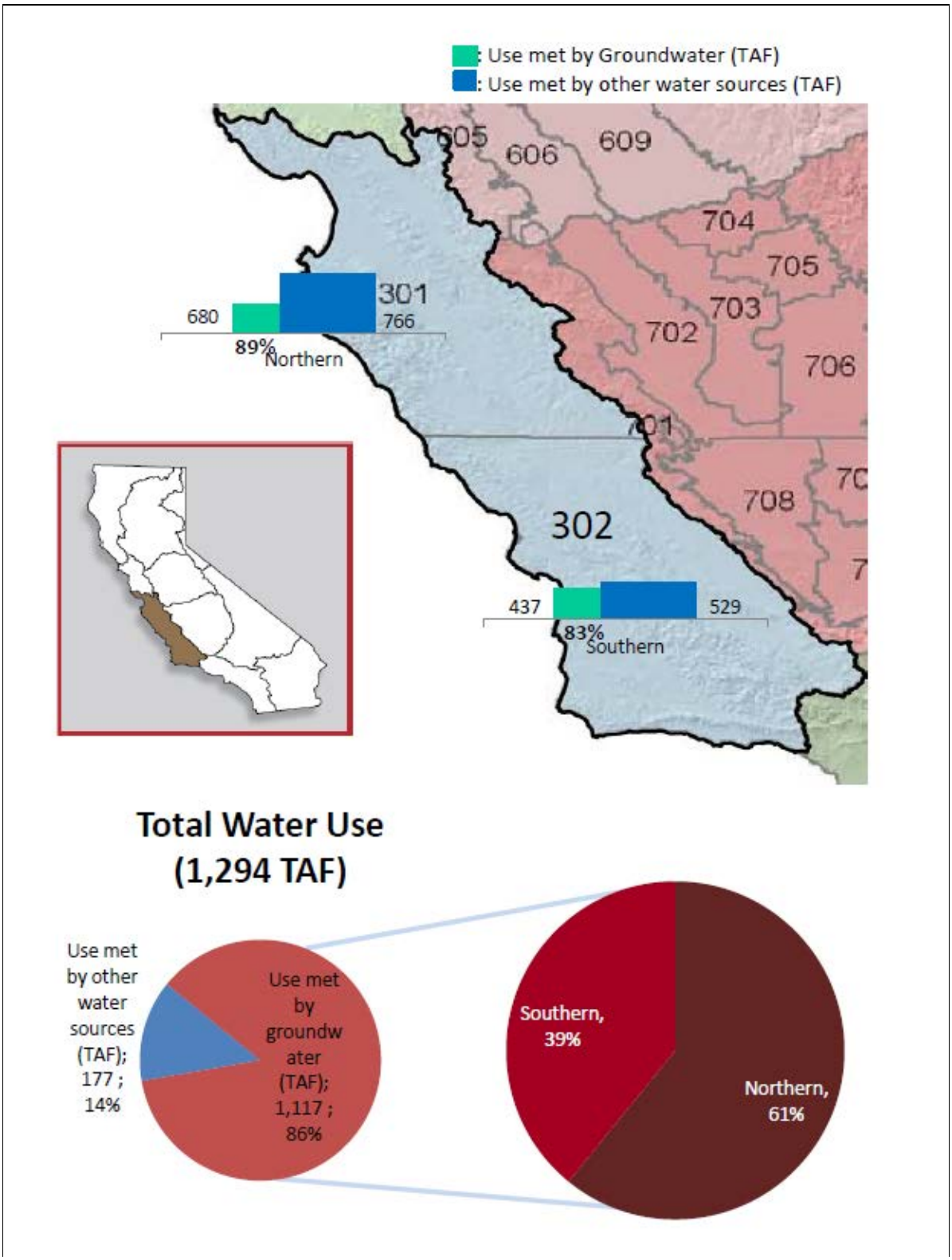
85 Number: 1 Author: trachemm Subject: Comment on Text Date: 12/4/2013 9:26:28 AM
The numbers for CVP supplies don't match text in other sections of the report.

The legend should describe the blue dashed lines (imported water infrastructure)

Figure CC-18[1] Contribution of Groundwater to the Central Coast Hydrologic Region Water Supply by Planning Area (2005-2010)



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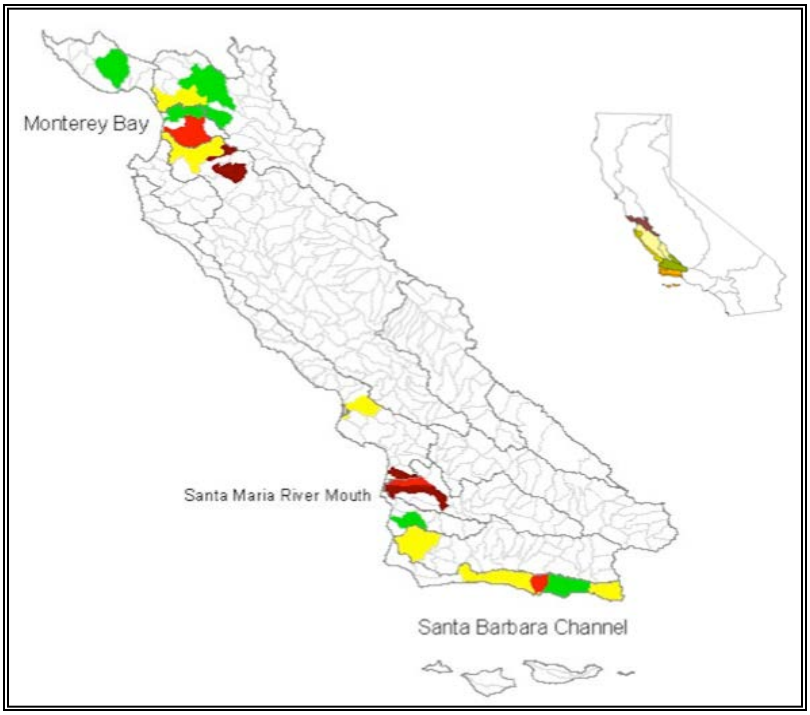
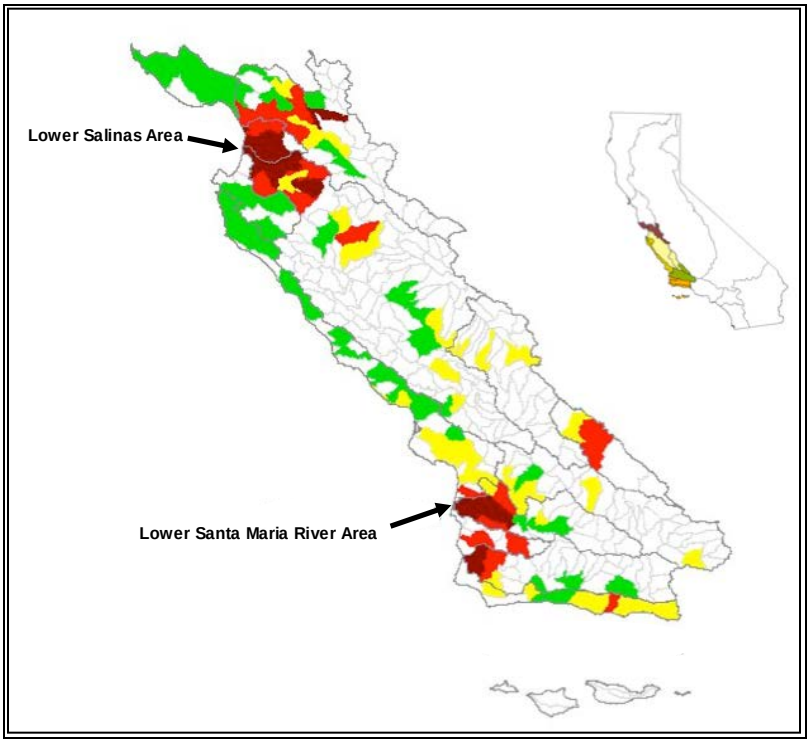
86 Number: 1 Author: georcook Subject: Highlight Date: 12/4/2013 5:10:42 PM
The blue bar should be labelled "Total Water Use" instead of "Use met by other water sources"

Figure CC-23[1] Central Coast Surface Water Quality Index using Multiple Parameters



87 Number: 1 Author: georcook Subject: Highlight Date: 12/2/2013 4:10:21 PM
Add legend to explain what the different colors represent

Figure CC-24 Central Coast Surface Water Quality Toxicity Index



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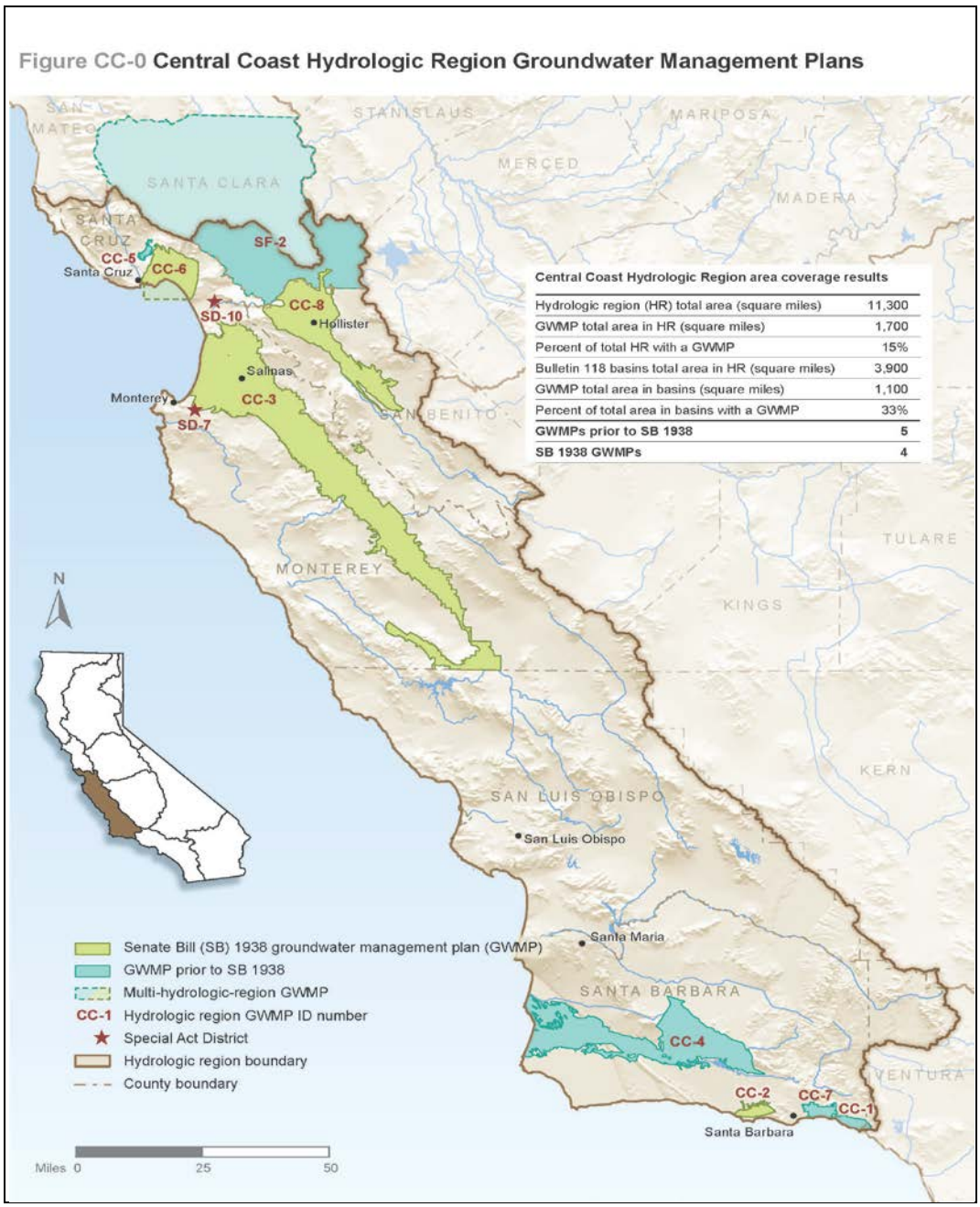
88 Number: 1 Author: georcook Subject: Highlight Date: 12/2/2013 4:10:51 PM
Add Legend

Figure CC-28 Location of Groundwater Management Plans in the Central Coast Hydrologic Region



89 Number: 1 Author: georcook Subject: Highlight Date: 12/2/2013 4:15:08 PM
Llagas Subbasin should be highlighted green as SCVWD completed Groundwater Management Plan consistent with SB 1938 in 2012.